School foodservice directors’ perceptions of value and cost of using agriculture commodities in child nutrition programs

by

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Commodity foods are available to child nutrition programs (CNP) through the United States Department of Agriculture (USDA) Food Distribution Program. Using USDA commodity foods creates costs for CNP due to non-value-added expenses such as storage and delivery. Programs such as net off invoice (NOI) have been implemented in the past five years to remove non-value costs. Use of these programs is voluntary by the state distribution agency, manufacturers, and distributors. The purpose of this research was to compare CNP director perceptions on cost and value of commodity foods in states that use NOI and perceptions of CNP directors in states that do not use NOI as a value pass through (VPT) method.

Methods

Qualitative and quantitative research using focus group and a survey design method were used to determine CNP director use of NOI and perceptions of cost and nutrient content of commodity foods in CNP. A total of 2,868 letters containing a website link to an Internet survey were emailed to CNP directors in 8 purposely selected states. Four states used NOI (Florida, Illinois, Pennsylvania, and Texas) and 4 states did not (Georgia, Massachusetts, Missouri, and Washington). States were selected based on volume of commodities used, number of CNP directors to obtain a similar sample size of those using NOI and not using non-NOI, and availability of email addresses.

Results

Study results indicated 75% of CNP directors had unused commodity foods at the end of the school year with 95% reporting end-of-year delivery as the reason for unused
commodity foods. CNP directors in NOI states reported left over entitlement dollars and commodity food inventory remaining at the end of the year less often than CNP directors in non-NOI states do. NOI was the VPT system preferred by the majority of CNP directors in NOI and non-NOI states.

CNP directors in NOI and non-NOI states agreed that diverting bulk commodity foods to manufacturers for further processing reduced labor costs and allowed directors to serve commodities in forms students preferred. More CNP directors in NOI states agreed or strongly agreed nutrition was more important than cost when making food purchase decisions for CNP.

**Conclusions and Applications**

Increased use of NOI by more states, distributors, and manufacturers may reduce the non-value-added cost of using commodity foods, allow more flexibility for CNP directors to receive commodity foods through commercial distribution channels, therefore provide more options to choose commodity foods with nutrient content desired. Eliminating commodity food storage will help remove non-value-added costs in commodity distribution for CNP directors. Research is needed to quantify the amount of commodity food inventory and entitlement dollars left at the end of the school year and determine reasons for end-of-year delivery.

Additional research is needed to determine how commodity distribution decisions are made at the state level. To continue improving commodity programs, increased education for CNP directors, state distribution agencies, and manufacturers on efficient commodity processing programs is needed.
CHAPTER 1. INTRODUCTION

Dissertation Organization

This dissertation on the perceptions of value and cost of agriculture commodities in child nutrition programs includes an introduction to provide background information on the use of agriculture commodities in child nutrition programs and purpose of this research. A review of literature provides an historical perspective of commodity distribution programs for schoolchildren and the challenges faced by child nutrition program directors related to use of agriculture commodities. The review of literature concludes with an overview of changes and updates to the commodity program.

Next, methods used to conduct this research are described. These chapters are followed by three manuscripts prepared for publication that include a commentary paper on changes in the commodity program and two research manuscripts that examine child nutrition directors’ perceptions of cost and value of using commodities in child nutrition programs. Summary and conclusions are followed by appendices that support this research and a list of references cited in the non-manuscript chapters.

Background

Daily, 29.6 million of the 54 million children attending America’s public and private nonprofit schools eat school lunch (School Nutrition Association [SNA], 2006; United States Department of Education [U.S. DOE], 2005). Sources agree that about 95% of public and nonprofit private elementary and secondary schools participate in the National School Lunch Program (NSLP) (Food Research and Action Center [FRAC], n.d.).

United States Department of Agriculture’s (USDA) commodity distribution program was designed to serve a dual purpose to: 1.) support American agriculture and 2.) provide
nutritious food for the nation’s schoolchildren (USDA, 2000, 2006a). Commodity foods are an integral part of school meals programs. During school year (SY) 2005, USDA purchased over 1.1 billion pounds of food commodities for Child Nutrition Programs (CNP) valued at over $800 million that were distributed in over 94,000 public and private non-profit schools that provide meals to students (USDA, 2006a). Commodity foods, also called entitlement or donated foods, are provided to school food authorities (SFA) at various rates each year. In SY 2005-06, SFA received $0.1750 in commodity food value for each qualifying lunch served (USDA, 2006a). During SY 2005-06, schools received maximum cash reimbursement rates of $2.49 for each qualifying free lunch served, $2.09 for each reduced, and $.30 for each full-price lunch served (USDA, 2005a). These funds are used by school districts for administration of NSLP. Commodities are not provided for USDA’s School Breakfast Program.

The CNP is funded through three USDA programs: Section 4, Section 11, and Section 32, all of which are entitlement funds enacted by federal legislation. The commodity food program is funded through Section 32 entitlement funds. To qualify for funding, meals served must meet federal requirements and free or reduced-price lunches must be offered to eligible children (USDA, n.d.d).

According to the SNA, primary and secondary school foodservice operators purchased $7.2 billion of food, which was 15% of the $47.1 billion non-commercial foodservice market (SNA, 2006). The primary and secondary school segment ranked as the largest food purchaser in the non-commercial segment, behind vending and business and industry. SNA (2006) estimated commodity food purchases account for 20% of the food dollars used by CNP.
Commodities used for school lunch meals represent dollars saved in a CNP director’s cash expenditures for commercial food products. According to USDA’s *Food Distribution 2000 Proposal for Change* (USDA, 2000), commodity funds should be used in an effective and efficient manner to maximize food purchasing power and minimize waste and non-value-added activities and expenses. Each dollar spent on unnecessary storage or other non-value-added costs, or spent for food that students will not eat, is wasted money (USDA, 2000). Maximizing use of commodities allows CNP directors to use funds for other areas of the CNP, such as purchasing equipment, merchandising, or purchasing higher-quality foods (USDA, 2000). Student satisfaction with school meal programs is reflected by increased participation. A U.S. General Accounting Office (U.S. GAO) report (1996) showed that students reported increased satisfaction through higher participation rates and decreased plate waste when offered brand-name items. The U.S. GAO (1996) report also showed brand-name items led to increased school lunch and a la carte sales.

Managing food costs to ensure quality and optimize financial performance is a challenge for many school foodservice directors (Hwang & Sneed, 2004). Wise use of commodity foods can decrease the amount of dollars needed to buy commercial food products for CNP. A study conducted by USDA’s Economic Research Service (ERS) stated that improving the selection of commodity foods may be a strategy to decrease plate waste in CNP (Guthrie & Buzby, 2002). The ERS study also noted USDA’s effort to improve the nutritional profile and acceptability of commodity foods (Guthrie & Buzby, 2002).

Trends indicate that use of commodity foods by schools declined from 30% of the food dollar in school year 1984-85 to 13% in 1996-97 (USDA, 1998). This 17% decrease in commodity food use indicates that school food purchasing practices have changed (USDA,
According to the USDA *Food Purchase Study* conducted in school year 1996-97, 83% of foods purchased for CNP were purchased commercially, 13% were donated by USDA, and 4% were processed foods containing donated commodities (USDA, 1998).

According to *Food Distribution 2000* (USDA, 2000), the commodity program has grown and improved over the years; however, improvements have not kept up with changes in the food industry, schools, technology, and consumer preferences. The Commodity Improvement Council (CIC), formed by four USDA agencies, Food and Nutrition Services (FNS), Agriculture Marketing Service (AMS), Farm Services Agency (FSA), and Food Safety and Inspection Service (FSIS) identified a variety of problems in the commodity program. These include increased cost of the final product, fewer bids from industry, unpredictable USDA commodity deliveries, shipments bunched all at one time (often at the end of the school year), and products in forms difficult to use (USDA, 2000). In addition, states responsible for distribution of the commodity foods have imposed a variety of local policies and procedures that have added cost and delayed delivery of commodity foods. The CIC’s 1999 report indicated lack of consistent state commodity systems for ordering, distributing, and tracking commodity credit, known as value pass through (VPT) systems, is a challenge for USDA, state commodity directors, manufacturers, distributors, and CNP directors (USDA, 2000).

USDA’s Business Process Reengineering (BPR) revamped the commodity program and created dramatic changes in the distribution process. Two changes that resulted in a more efficient and seamless commodity ordering, manufacturing, and delivery process were: 1.) substitution of an equal or better product that occurs in the manufacturing process and 2.) net off invoice (NOI), a hybrid sales discount system to provide credit for commodity foods
contained in commercial products. This system allowed just-in-time delivery of commodity foods to eliminate storage and delivery costs. These changes allowed CNP directors to purchase commercial products, while still receiving commodity credit (USDA, 2000).

The State Processing Program is a component of the commodity program that allows states and eligible recipient agencies such as school districts to contract with commercial food manufacturers to convert bulk or raw USDA commodities into more convenient ready-to-use end products. Once commodity food is made available to states, the overall organization and administration of the State Processing Program become the responsibility of the state agency. State agencies work with CNP directors, food manufacturers, and distributors to distribute commodity foods. Some state agencies manage a state commodity warehouse system.

State commodity directors determine which VPT systems will be used for each commodity category in their state (USDA, 2006c). Since 2003, when NOI was approved by USDA, 21 states have adopted NOI (K12 Services, Incorporated, Rockville, MD, 2006). Other recent changes approved by USDA in the commodity distribution program streamlined manufacturer agreements from individual state agreements to a single National Master Processing Agreement (NMPA). Commodity ordering was streamlined when the Electronic Commodity Ordering System (ECOS) was implemented by USDA. ECOS allows the state agency and CNP directors to place commodity orders online directly with USDA. CNP directors may have access to ECOS to place orders with the state and monitor commodity transactions. Nine states permitted CNP directors to order commodities on ECOS and 25 states allow CNP directors access to ECOS to monitor commodity distribution (personal communication, Cathie McCullough, September 20, 2006). Although ECOS is available to
all states, not all CNP directors have access to the electronic system. In some states, ECOS is used by the state agency and CNP directors are not allowed access to the electronic system. Use of ECOS, like NOI, is determined by the state commodity director’s office (USDA, 2006c).

Commodity products offered by USDA vary in form and nutrient content. There are 13 food categories with over 100 various forms offered through the commodity distribution program for school year 2006-07 (USDA, n.d.g). An April 2006 USDA School Programs Commodity Update newsletter (2006b) stated that in the next year, several commodity specifications would be reviewed to support the 2005 U.S. Dietary Guidelines for Americans (DGA). Nutritional goals targeted include reduced sodium in canned vegetables and increased whole grain offerings such as whole grain pasta and quick-cook brown rice. Another area under consideration is reduction of trans fatty acids (USDA, 2006b).

USDA’s commodity program has served a valuable purpose, however, in the program’s 70-year history the program has not kept pace with changes that occurred within the school environment. Recently, changes have taken place throughout procurement, manufacturing, and distribution that update the commodity distribution process (USDA, 2000). These system changes can eliminate non-value-added costs and lead to improved nutrition content of commodity foods.

**Purpose of the Study**

The purpose of this study was to examine the use, cost, and value of commodity foods in states using NOI and those not using NOI as a VPT system in the NSLP. There is a need to identify and reduce cost of using commodities in CNP. Reduction of non-valued added costs could create a more convenient and economical commodity distribution program.
This may allow the state agency and CNP director greater use of commodity program dollars to be directed toward more commodity food purchases in forms desired by students, delivered through the same channels schools receive commercial foods, and with just-in-time delivery that could enhance product quality.

**Research Questions**

To achieve the objective of this study, several research questions were posed:

1. Do CNP directors in NOI states report less unused commodity dollars and commodity food inventory at the end-of-year compared to CNP directors in non-NOI states?

2. Do CNP directors in NOI states have different attitudes toward the importance of nutrition, cost, and convenience of commodity foods compared to CNP directors in non-NOI states?

3. Is NOI participation independent of use of ECOS?

4. What department within the school district (foodservice or school district operations department) or state agency assumes responsibility for costs associated with using commodity foods, such as storage and transportation of commodities?

5. Does average daily participation in NSLP relate to the time it takes to manage commodity foods?

6. What are CNP directors’ perceptions of nutrient content of commodity foods?

7. Do School Foodservice and Nutrition Specialist (SFNS) credentialed directors and non SFNS credentialed directors have a different average number of years of service?
Significance of the Research

This research will benefit many stakeholders in CNP. It will support reduction of non-value-added costs that may create a more convenient commodity distribution program. This research also will add to the limited body of literature related to commodity foods.

Efficient use of commodity foods can help CNP directors operate a more cost-effective foodservice program by maximizing use of commodity foods to reduce expenditures on commercial foods. This decrease in non-value-added costs, such as the cost associated with storage, may result in more money available to purchase equipment or merchandise the program to increase participation and generate revenue.

CNP directors will benefit from this study because results will provide insight into differences that exist in costs of using USDA commodity foods in states using NOI and in states not using NOI. CNP directors can use this information with state commodity and CNP state directors to determine what commodity distribution and value pass through systems are best for their state. This research will determine if just-in-time delivery offered with NOI will maximize use of commodity foods. CNP directors will benefit by receiving commodity food products through scheduled deliveries that eliminate infrequent or large truckload quantities at unscheduled times or receiving end-of-year deliveries that lead to storing truckloads of commodity foods over summer months. These changes may lead to higher quality commodity foods. Just-in-time delivery allows CNP directors to order commodity foods through regular commercial distribution.

USDA will benefit from this research, by identifying differences between states using NOI and states not using NOI as a VPT. Those differences in costs, convenience, and nutrition of using commodity foods may lead to policy changes that direct funds toward
additional food purchases rather than non-food costs (such as storage and delivery). This research can provide initial background information for future pilot tests that can lead to new processing options that reduce production and distribution expenses by allowing bulk purchase of raw, unprocessed forms for CNP directors to process into desired products preferred by students. These recovered funds can be directed toward equipment, upgrades, or purchasing fresh vegetables and fruits or low-fat center of the plate proteins. These changes may have a positive impact on the nutrient content of school meals.

Manufacturers will benefit from results of this research. Information related to the differences reported by CNP directors in states using NOI and states not using NOI will be helpful for manufacturers to learn CNP director preferences for NOI. NOI is preferred VPT system of many manufacturers based on streamlined processing and distribution as was demonstrated in the Full Substitution Demonstration Project #3 (USDA, 2003c). Processors and CNP benefit from research that could show commodity foods commingled with commercial food inventory leads to greater program efficiency. Research that demonstrates positive CNP preference to NOI as a convenient VPT system may encourage more manufacturers to use this system. Currently, little research other than USDA demonstration and pilot projects has been conducted with NOI. Efficient use of commodity funds may lead to increased USDA procurements and increased school business for manufacturers.

School business officials and purchasing agents also will benefit from this research as they may see a greater return on the dollars allocated for the district’s CNP. Those dollars can be reinvested in district CNP to generate increased participation. A smaller percent of general budget funds and fewer district and staff resources may be required to operate CNP as a result. If a school district is currently warehousing and delivering all commodity food
allocations, these expenses may be eliminated with NOI, as commodity foods would arrive with other commercial food and supplies on regularly scheduled deliveries as needed from local distributors.

Information from this research can be used by CNP directors when talking to state agencies in requesting alternative VPT systems not offered currently by the state. Eliminating end-of-year deliveries or bunching commodity deliveries will save CNP directors dollars in the foodservice budget that can be used to purchase more equipment or allocate funding to marketing activities to increase CNP participation.

Students will benefit from this research, as NOI may allow greater flexibility to CNP directors to purchase different foods throughout the year to accommodate changing food preferences of students. CNP directors would be able to order more than one product variety from a truckload of commodity food. For example, from a 40,000 pound truckload of beef, the CNP director would be able to request fully cooked hamburger patties, ground beef, taco seasoned meat, meatballs, and other items offered by the manufacturer. Greater variety of commodity foods, more commodity food options that are similar to commercially available foods, and greater access to commodity offerings throughout the school year may lead to increased participation in commodity distribution by CNP directors and NSLP by students. Moreover, changes may result in commodity foods with favorable nutrient profiles.

Limitations of the Study

Limitations of this study include the sample size of only 8 states, 4 states using NOI and 4 states not using NOI. The choice of states may affect study outcomes based on differences among states and local regulations set by the state commodity director, which creates unique commodity distribution environments within each state. Selection of states
was based on availability of email addresses of CNP directors that eliminated some states from the study.

Availability of commercial food distribution systems within a state may limit commodity distribution options and influence study outcomes. Timing of the survey may have limited responses due to variation in CNP staff employment agreements of 9-to-12 month employees. The survey may have arrived when the CNP was not back in school or were preparing to open the cafeteria for the school year and they may not have taken the time to complete the survey.

CNP directors may not be aware of non-value-added costs associated with using commodities and may not consider storage, administrative staff salaries, or waste of unused commodities as a cost of using commodities, which may affect responses. Limitations based on administration of State Processing Programs may limit CNP director awareness of commodity processing options available to states and CNP. Individual differences among each state’s distribution options may create limitations for the State Processing Program and CNP. Some state commodity directors allow CNP directors greater independence in commodity decisions. This may affect responses to the questionnaire. In addition, CNP directors participating in a buying cooperative, group-purchasing organization, or a foodservice management company would have different responses. Directors employed by foodservice management companies may not have responded to the survey as they may not make food or commodity purchasing decisions. The researcher assumed that buying cooperatives, group purchasing organizations, and foodservice management company operations would be represented in the sample at a ratio similar to which they occur in the study population.
Additional limitations may relate to quality of email address lists available from state agencies or associations. Email address lists were provided at no cost, which may limit accuracy compared to a list purchased through a commercial marketing company.

**Definition of Terms**

Agriculture Marketing Service (AMS): The division of the United States Department of Agriculture (USDA) that makes available surplus foods as commodities to be distributed in programs such as National School Lunch Program (NSLP) (USDA, n.d.a).

Average Daily Participation (ADP): The total number of students eating a reimbursable meal at school in a month divided by the number of serving days in that month (USDA, n.d.i).

Bonus Commodities: Foods that are in major oversupply that are provided by USDA’s Agriculture Marketing Service (AMS) to USDA’s Food and Nutrition Service (FNS) for distribution to schools. These foods are not counted as part of commodity entitlement foods (USDA, 1999).

Bunching of Commodities: USDA makes a commodity purchase, foods are processed, and delivered to schools all at one time, not spaced periodically throughout the year (USDA, 2000).

Commercial Food Items: Food items available through general foodservice distribution, regularly served by schools that may or may not contain USDA commodity ingredients (USDA, 2000).

Commingle: To store, combine, or blend commercial food and fully substitutable donated food together into a single inventory at a processor’s plant (USDA, n.d.h).
Commodity, Donated, or Entitlement Foods (commodities): Foods donated or made available by the USDA for use in government meal programs that include schools. Commodity foods are provided to recipient agencies through entitlement funds, to be distributed to the end user, such as to schools through State Distribution Agencies (USDA, n.d.i).

Commodity Food Cost: The value of donated commodity food minus the costs associated with processing bulk or raw foods into usable forms, this value is established by USDA on November 15th each year (USDA, n.d.h).

Commodity Processing: Processing of USDA commodities and bonus commodities into foods that schools serve to students. This usually entails the transformation of large quantities of raw product into food in a form that can be directly served. For example, a 36,000 pound truckload of live chickens are transformed into 40-pound cases of frozen whole chickens or 20-pound cases of fully cooked breaded chicken nuggets (USDA, n.d.a).

Direct Discount Sale: The selling of a finished end product by a commercial food processor directly to the distributing agency or the recipient agency. Under this procedure, the processor directly invoices the distributing agency or recipient agency at the net case price. The processor must maintain delivery and/or billing invoices to substantiate the quantity of end products delivered and the net price charged per case (USDA, n.d.h).

Distributing Agency, Distribution Agency, State Distribution Agency, State Distributing Agency, or State Agency: The agency, also known as the state agency, usually an agency of state government that enters into an agreement with Food and Nutrition Service (FNS) for the distribution of donated foods to eligible recipient agencies such as CNP. This office on the state level also is responsible for food processing
agreements between recipient agencies and commercial food manufacturers. State Distribution Agencies also may operate and manage a state warehouse system to distribute USDA commodity foods (USDA, n.d.i).

Electronic Commodity Order System (ECOS): The Internet system by which USDA, State Distribution Agencies, CNP directors, manufacturers, and distributors order and monitor use of commodity food entitlement dollars and foods. State Distribution Agencies determine level of use at the CNP director level (USDA, n.d.b).

End Products: Foods prepared from commodity raw materials. Finished food products are generally processed into fully cooked or easy-to-use foods desired by students. An example would be macaroni and cheese created from commodity cheese (USDA, n.d.h).

End Product Data Schedule (EPDS): A standard form used to describe the finished end product being produced. Information detailed on this form includes formulation, quantity of donated food needed to produce a specific number of units of end product, pricing, packaging, and yield information (USDA, n.d.h).

Fee For Service (FFS): The price charged per pound or per case for products, representing a processor’s costs of ingredients other than donated foods (labor, packaging, overhead, and other costs incurred in the conversion of the donated food into the specified product). Fee for service is an alternative to using a VPT system. It primarily applies to meat and poultry products or other non-substitutable donated foods (USDA, n.d.h).

Food Nutrition Services (FNS): The USDA agency responsible for administering 15 domestic food assistance programs (USDA, n.d.i).
Full Substitution: A processor can substitute commercial food for commodity food (except beef, pork, and poultry on a limited approval basis) without restriction, as long as the substitute food has the same generic identity, equal or better quality, and domestic origin (USDA, n.d.h).

Indirect Discount System or Indirect Sales Discount: A system where the processor sells to a distributor at a gross price and the distributor sells to the recipient agency at a net price. Under this system, the distributor applies for the refund. This system is also referred to as the “hybrid” system (USDA, n.d.h).

Just-In-Time Delivery: Delivery of goods and services at the time the order is placed. This system reduces large volume deliveries (Womack & Jones, 1996).

Lean processing: A manufacturing system that eliminates non-value added costs. Features of lean processing include use of half the manufacturing space and half the investment in tools to produce products in half the time with fewer defects (Womack & Jones, 1996).

Master Agreement or Agreement-Donated Food: An agreement in which the distributing agency enters into an agreement with the processor and only designated eligible recipient agencies may purchase end products from the processor (USDA, n.d.h).

National Master Processing Agreements (NMPA): A master agreement between commercial multi-state food processors and FNS, whereby FNS enters into the agreement, approves the EPDS, and maintains the safety for inventory protection (USDA, n.d.h).

Net Case Price: The price of a processed end product paid by recipient agency after the value of donated food contained in the end product has been deducted from the gross price (USDA, n.d.h).
Net Off Invoice (NOI) Indirect Discount System: A system where the processor sells to a distributor at a gross price and the distributor sells to the recipient agency at a net price, and where the value of commodity food contained in the product is reduced from the distributor invoice. Under this system, the distributor applies for the refund. This system is also referred to as the “hybrid” system. Example: If a school district CNP program receives commodity entitlement of one 36,000 pound truckload of chicken, the CNP director may order 100 pounds of chicken in the form of patties, the distributor takes the patties from regular foodservice distribution and subtracts the agreed upon commodity value from the purchase price listed on the school district invoice. The commodity value of the chicken is determined by USDA each year on November 15th and posted on the “November 15th price file” on the USDA FNS Food Distribution Website. The school does not pay for the value of chicken meat in the patties (USDA, 2006c).

Non-value costs or Non-value-added costs: Costs that do not result in productivity of human, financial, or physical capitol such as extended storage time, excessive movement within a production process such as delivery fees, administrative time to complete paperwork, and management of excessive inventory levels (Womack & Jones, 1996).

Planned Assistance Level (PAL) or Cash Assistance: The dollar value of commodities a school CNP is eligible to receive each year, which is based on the total number of qualified lunches the school served to children in the preceding school year multiplied by the rate of assistance mandated by USDA. PAL is equal to ADP multiplied by number of school days multiplied by USDA reimbursement rate (set July 15 each year) (USDA, n.d.i).
Processor or Manufacturer: Any commercial company that processes or repackages donated foods. However, commercial enterprises that handle, prepare, and/or serve products or meals containing donated foods on-site solely for the individual recipient agency under contract are exempt under this definition. School food authorities who provide meals to other eligible outlets are exempt from being defined as processors if they provide accountability for the commodities and assurance that the value of the commodities is passed on to the school food authority’s foodservice account (USDA, n.d.h).

Rebate or Direct Refund Sale: The selling of a finished end product by a commercial food processor, directly to the recipient agency. Under this VPT system, the processor invoices the recipient agency directly for the commercial/gross case price of the end product. The recipient agency must then submit a refund application to the processor (USDA, n.d.h).

Recipient Agency (RA): The state, SFA, or agency responsible for receipt of USDA commodity food products for use in school CNP or childcare facilities (USDA, n.d.f).

Recipient Agency Agreement: Under a recipient agency agreement, the recipient agency or SFA enters into an agreement with the processor. This kind of arrangement requires the approval of the distributing agency. Once approved, the recipient agency may purchase end products from that processor (USDA, n.d.h).

Refund Application: An application (usually a pre-printed form) completed by a recipient agency or distributor and sent to the processor that certifies the purchase of end products. Receipt of the refund application obligates the processor to refund the
contract value of the donated food contained in the end products purchased (USDA, n.d.h).

Refund System: A VPT system through which a recipient agency purchases a processor’s end products and receives from the processor, by means of a refund application, a payment equivalent to the contract value of the donated foods contained in the end products (USDA, n.d.h).

School Food Authority (SFA): Generally the CNP director, superintendent, or other agent within the school district responsible for accepting and managing the foodservice program, includes commodity distribution (USDA, n.d.i).

School Year (SY): The school year begins July 1 each calendar year and ends June 30 of the following calendar year. Processing agreements are set up on a school year basis (USDA, n.d.i).

Section 4 Funds: State Administrative Expense (SAE) funds provided to school meal programs for program operations (USDA, n.d.i).

Section 11 Funds: Cash reimbursement provided by the government to school meal programs for meals served free or at reduced price to needy children (USDA, n.d.i).

Section 32 Funds: Funds made available by Section 32 of Public Law 74-320 passed and signed into law in 1935 for money equal to 30% of import duties collected from customs receipts to be used for commodity foods (USDA, n.d.d).

Standard Yield: A concept that fixes the number of finished cases that a recipient will receive from a fixed truckload of raw commodity. Any standard yield will be higher than a processor could normally achieve in regular processing. This requires the processor to add some commercial product to the commodity product (USDA, n.d.h).
State Agreement: Under a state agreement, the distributing agency negotiates bids and/or prices, selects the processor and the end products that will be produced, and enters into an agreement with the processor (USDA, n.d.h).

State Processing Program: A program used by states and eligible recipient agencies, such as school districts, to contract with commercial food processors to convert bulk or raw USDA commodities into more convenient ready-to-use end products (USDA, n.d.i).

Value Pass Through (VPT): A system used to ensure that full value of donated commodity food contained in commodity end products is passed on to the eligible purchasing recipient agency such as schools (USDA, n.d.h).

Disclosure Statement

The researcher is employed by Tyson Foods, Incorporated and some time was provided to the employee for this research. The content is solely the responsibility of the author and does not necessarily represent the view of the company.
CHAPTER 2. LITERATURE REVIEW

The National School Lunch Program (NSLP) is a permanently authorized, federal entitlement program with funds budgeted by Congress each fiscal year. USDA (2005c) figures indicated federal funds totaling $7.9 billion in cash payments and commodity food value were used in the NSLP in 2004. Labor and food purchases were the primary costs for Child Nutrition Programs (CNP) in 6 states that participated in a U.S. General Accounting Office (U.S. GAO) study (2003) on revenue and expenses of school meal programs. Labor costs, including salaries and benefits of foodservice staff, increased at a higher rate compared to food expenses and varied considerably among states participating in the research. GAO researchers reported CNP directors contained labor costs by serving more pre-packaged foods that required less preparation, reducing staff numbers, and replacing full-time staff with part-time staff. To reduce food costs, CNP directors reported that they planned menus around USDA commodities, purchased food in bulk, and found new ways to purchase lower-priced foods. Thus, commodities can be both a cost and labor saving measure for CNP.

USDA commodity programs at the federal, state, and school district level contain non-value-added expenses that increase the cost of using USDA commodity foods in CNP (USDA, 2000). There is a need to identify and reduce non-value-added costs at all levels of CNP including federal, state commodity distributing agencies, manufacturers, commercial food distributors, and CNP. Federal commodity program administrators, with the assistance of the Commodity Improvement Council (CIC), recently developed several VPT systems that could allow CNP to receive commodity foods in forms specified by CNP directors rather than in forms offered by USDA (USDA, 2003a). Pilot tests and demonstration projects implemented by USDA confirmed cost savings and CNP director acceptance of processes
that allowed net off invoice as a VPT system (USDA, 2003b, 2003c). This system allowed just-in-time delivery of commodity foods and, eliminating storage and delivery costs for state distribution agencies and CNP directors. State commodity distributing agencies have the authority to determine which VPT systems will be available to CNP in their state (USDA, n.d.c). The option to participate in these newly developed commodity VPT systems also is given to each manufacturer and commercial foodservice distributor to allow CNP to receive credit for commodity food allocations. Research is needed to compare costs and nutritional value of commodity foods in states that use NOI and those not using NOI as a VPT system. Maximizing use of efficient systems will benefit CNP financially and could increase student participation.

The commodity distribution program is a multi-agency program that involves coordination between federal, state, and local administrators. Commodities play a vital role to support the program financially and nutritionally. This review of literature review will provide a history of the commodity food program and current practices related to the cost and nutritional value of commodity foods.

**History of Commodity Food Programs**

Today’s school commodity food program began in the early 1930s as a culmination of social, economic, and agriculture-related events. The commodity food program led to the development of the current Richard B. Russell National School Lunch Act. In this section, a review of federal labor programs, federal agriculture programs, state administration of federal programs, program expansion, the impact of World War II, signing of the National School Lunch Act, the commodity program in 1946-96, and the decline in the role of school commodity programs will be presented.
Federal Labor Programs

The Depression in the 1930s brought widespread unemployment for many Americans. With no means to support themselves and their families, many were obligated to seek help through public assistance programs (Gunderson, 1971). Gunderson reported the earliest federal aid resulted from the Reconstruction Finance Corporation in 1932 and 1933 when it granted loans to towns in southwestern Missouri to cover the cost of labor employed in preparing and serving school lunches. By 1934, these programs expanded to other areas under the Civil Works Administration and the Federal Emergency Relief Administration, reached 39 states, and employed 7,442 women.

In 1935, more federal programs were developed to help local communities. The Works Progress Administration (WPA) (later changed to Works Projects Administration) made available federal funds to provide work for citizens. Many jobs were found in schools preparing, serving, and performing administrative services for school lunch operations. Many teachers, generally the home economics teacher, supervised the WPA kitchen staff. Ernestine Camp, former Arkansas home economics teacher, school foodservice director, and USDA Southwest Regional Director, was involved in a WPA school garden project and supervised the WPA school kitchen staff in the Arkansas school where she taught in 1942 (National Food Service Management Institute [NFSMI], 2006).

Camp’s oral history reported her experience feeding schoolchildren during the early 1940s (NFSMI, 2006). Camp’s recollection of the years before the NSLP explained her work with WPA women who cooked and served lunch to schoolchildren. At the time the government’s support for school lunch was three cents per meal. Not all schools received government commodity foods before the NSLP was signed into law in 1946. When the
National School Lunch Act passed, schools began serving the Type A lunch. Camp reported government reimbursement at that time was nine cents per lunch. Due to lack of a local dairy, Camp’s school did not serve milk; therefore, the school received only seven cents per meal. In place of milk, the government commodity program provided one hundred-pound barrels of dry milk that was made into hot chocolate for the children.

Children paid five cents for school lunch. If they were not able to pay, the County Welfare Office certified family income, and those children were served a free lunch. Ten percent of the children in Camp’s school received free lunch. Schools such as this established the need for government support for low-income families and led to the national legislation that provided free and reduced-price lunches for children. Camp’s story was an example of a federal work program that was administered under state supervision (NFSMI, 2006).

**Federal Agriculture Programs**

At the same time, the depression created surplus food supplies from farm production that did not have adequate markets. Limited family income left schoolchildren hungry and the danger of childhood malnourishment became a national concern. In 1933, the Federal Surplus Relief Corporation was created and in 1935 became known as the Federal Surplus Commodities Corporation. This group procured USDA commodities that would not be purchased in the marketplace and distributed them to schools and needy families. This program helped farmers find an outlet for agriculture products at a reasonable price. Later this became the Surplus Marketing Administration and today is the USDA Agriculture Marketing Service.

In 1936, Public Law 320 enacted by the 74th Congress made available to the Secretary of Agriculture an amount of money equal to 30% of the funds collected from customs taxes
each year (USDA, n.d.d). These funds were to be in a separate fund to encourage domestic consumption of agriculture commodities. These funds, known as “Section 32”, were used to purchase surplus foods from producers that were distributed as domestic donations and exports that did not interfere with normal consumer sales channels (Gunderson, 1971).

As result of Section 32 legislation, CNP and needy children gained much needed food and agriculture markets and producers benefited economically (USDA, n.d.d). By 1939, Section 32 funds provided food commodities for CNP in over 14,000 schools reaching nearly 900,000 children.

**State Administration of Federal Programs**

Gunderson reported that from 1939 to 1940, special state representatives were hired by the federal government to work with state and local school authorities, and with parent-teacher and similar organizations to expand the CNP. At the state level, the director of commodity distribution was responsible for proper administration of the program. The state commodity director ordered foods from the government and arranged proper warehousing at strategic points throughout the state. This director also set up and maintained adequate records to account for the receipt and distribution of all foods shipped into the state, and reported to the federal government from time to time as required. The position of state commodity director separated commodity distribution into state and federal systems, each having different responsibilities to facilitate commodity food distribution to schools. In 1943, state administrators took full administrative and financial responsibilities for the donated food program and became known as distributing agencies (USDA, n.d.d).
Program Expansion

By 1941, WPA operated CNP in all states and reached a record breaking 5.3 million students in over 78,000 school buildings. The federal government provided 454 million pounds of commodity food valued at over $21 million. Over the next few years, school meal programs supported by WPA labor and Section 32 agriculture commodities helped the commodity distribution program grow to almost 93,000 school buildings and 6 million children.

World War II

In early 1943, the effects of World War II were felt in the WPA and agriculture support programs as scarce resources were directed toward the war effort. WPA labor for schools was eliminated and commodity food support was sporadic and meager, dropping from a high of 454 million pounds in 1942 to 93 million pounds in 1944 (Gunderson, 1971). In the next few years, a series of amendments to Section 32 limited expenditures and established provisions for the funds that increased tracking and record keeping. By 1944, only 34,000 school buildings were still part of the lunch program.

As World War II continued, the Selective Service System discovered that a large number of young men were not physically qualified for military duty. This physical inadequacy was attributed to lack of proper nourishment (Gunderson, 1971). In 1946, Robert Shields, USDA’s Administrator of Production and Marketing Administration, stated there was convincing proof that thousands of young people were poorly nourished as result of lack of proper food in childhood (NFSMI, 2005). Shields added that young people had not been trained to develop good eating habits. The connection between health and school meals was widely recognized and became deeply rooted in national security, which led to increased
legislation to support school meal programs. In wartime, nutrition programs such as CNP assumed a leading role for their value in safeguarding national health and security (NFSMI, 2005).

National School Lunch Act

In December 1945, it was apparent the program that was in operation had not expanded as rapidly as desired. The year-to-year appropriations by Congress without legislation to assure continued funding hampered program growth (Gunderson, 1971). Drastic declines in federal support and inconsistency of donated foods made school boards hesitant to expand facilities for the lunch program. An added challenge was the expense of equipment and installation, especially in larger schools. In the majority of school buildings, there was no room suitable for the installation of kitchen equipment. Separate dining space was not available and additions to or extensive remodeling of existing buildings was necessary for the program to continue. Without a guarantee of future funding, school lunch expansion was a high-risk investment for school districts.

The 79th Congress recognized the need for a permanent CNP, rather than one that operated on a year-to-year basis or that depended solely on agricultural surplus foods. Legislation was introduced that gave the program permanent status and authorized necessary appropriations (Gunderson, 1971). The House Committee on Agriculture urged state contributions and participation in the CNP to gain support for permanent funding. The national school lunch bill provided basic, comprehensive legislation for aid to states for operation of CNP as a permanent program within a school system. The bill generated additional support in Congress with examples and demonstrations that from 1935 to 1945, CNP had proven to be an exceptional benefit to children, schools, and agriculture of the
country as a whole. In many programs not only was the child to be taught what constituted a good diet, but parents and family also were to be instructed indirectly (USDA, 2005b).

In April 1946, President Harry Truman signed into law the National School Lunch Act (NSLA), now called the Richard B. Russell NSLA (USDA, n.d.d). The act stated,

It is hereby declared to be the policy of Congress, as a measure of national security, to safeguard the health and well-being of the Nation's children and to encourage the domestic consumption of nutritious agricultural commodities and other food, by assisting the states, through grants-in aid and other means, in providing an adequate supply of food and other facilities for the establishment, maintenance, operation and expansion of nonprofit school lunch programs (USDA, 2005b).

The Act provided for both cash and commodity food support for school lunch. Its purpose was not only to provide a market for agriculture products, but also to improve the health and well-being of the nation’s youth. By April 1946, the program reached over 45,000 schools serving 6.7 million children daily (Gunderson, 1971).

Commodity Programs 1946 to 1996

The commodity program continued to play an important role in the NSLP. The Agriculture Act of 1949, subsequent amendments such as Section 416, and various price-support programs made certain commodities were available to schools and needy people (USDA, n.d.d). These donations also covered processing, packaging, and handling costs for foods acquired under price support so schools and recipient agencies could more fully use them. The goal was to increase consumption of foods acquired under price support (USDA, n.d.d). In 1961, legislation was enacted to set a minimum level of commodity assistance for schools. Throughout the late 1960s and early 1970s, efforts to end price support programs
failed and Congress mandated commodity assistance for CNP. During that time, several other food assistance programs were created for schools including the School Breakfast Program, Summer Food Service Program, Child and Adult Care Food Program, and Nutrition Services Incentive Program. These, along with the Food Stamp Program, continue today. Since the 1970s, additional commodity programs have included the Commodity Supplemental Food Program, now called Women, Infants, and Children (WIC) program, and the Food Distribution Program on Indian Reservations.

The 1980s weak farm economy increased donations to all commodity outlets. Previously, schools with formalized, large-scale systems were favored as commodity outlets. The 1980s opened commodity donations to community soup kitchens, food pantries, and emergency disaster feeding (USDA, n.d.d). Temporary Emergency Food Assistance Program grants to states helped with cost of transporting, storing, and distributing commodities during emergency feeding. In 1996, the “Contract With America” welfare reform provisions proposed to cut all child nutrition entitlement programs in favor of block grants to the states. Strong support by school nutrition professionals defeated the legislation, and child nutrition programs remained intact (SNA, 2006).

**School Commodity Program Participation**

The role of donated commodities decreased from 30% of school food purchases in SY 1984-85 to only 13% in SY 1996-97 (USDA, 1998). According to the School Food Purchase Study, in 1996-97 public school districts acquired food market valued at more than $4.6 billion. Of the total value of food acquisitions, 83% was purchased commercially, 13% was donated by USDA, and 4% was processed foods containing donated commodities. Foods such as peanuts, peanut butter, turkey products, beef products, cheese, eggs, flour, vegetable
oils, and shortening accounted for half of the total value of all commodity acquisitions (USDA, 1998).

The decline in commodity use was attributed to changes in the school environment that took place during the 1990s (USDA, 2000). Student taste preferences changed, popularity of heat-and-serve foods increased, and availability of processed items increased. The cost of labor increased and the availability of labor decreased. In addition, school boards and superintendents placed emphasis on financial performance and expected CNP to run like a business with break-even or better financial records (USDA, 2000). A la carte foods became widely used in school cafeterias as alternative options to serve students and increase revenue (U.S. GAO, 2003). Popularity of vending increased during the 1990s. According to the Centers for Disease Control and Prevention’s School Health Policies and Programs Study (SHPPS), 43% of elementary and 98% of high schools offered food to students outside the school meal program in vending, school stores, canteens, or snack bars (CDC, 2000).

USDA’s CIC discovered CNP directors changed procurement practices based on alternative food choices available from manufacturers at reasonable prices (USDA, 2000). CNP directors were no longer dependent on commodity foods such as uncooked, frozen chicken that required additional preparation and labor, when students preferred chicken nuggets and pizza. The cost of using commodity foods became more expensive than using similar commercially available products because commodity foods in bulk forms required high cost labor to transform them into usable end products to serve to students (USDA, 2000). CNP directors reported reduced number of staff hours to help decrease program costs; as a result they purchased prepared and pre-packaged foods such as chicken nuggets and frozen pizza that required little staff time to prepare (U.S. GAO, 2003). These factors
affected CNP directors’ attitudes toward commodities and their expectations for the commodity program.

**Cost of Using Commodity Foods**

This section of the literature review examines the impact of CIC on commodity programs today. Fundamental changes allowed state processing programs to offer alternative processing and value pass through systems (USDA, 2000). This transformation was the first step in efforts to improve how commodities were delivered to schools (USDA, 2000). Various state processing programs and their benefits also are explained in this section.

**Commodity Improvement Council (CIC)**

In September 1998, the CIC, comprised of four USDA Under Secretaries involved in commodity distribution from FNS, AMS, FSA, and FSIS, was convened to learn more about problems and challenges facing the commodity program (USDA, 1999). Individuals representing various aspects of school meal programs, commodity ordering, processing, and distribution were involved from schools, industry, state, and federal government. A full-time tri-agency team from FNS, AMS, and FSA, who reported directly to the Senior Oversight Committee (SOC), was established to develop, manage, and implement the agreed-upon changes of the reinvention plan.

The USDA’s Business Process Reengineering (BPR) was the largest ever transformation undertaken by a government agency. Characteristic of a BPR, USDA’s program changes were designed to be dramatic, quick, and fundamental (Hammer & Champy, 1993). These changes in how business was conducted involved more than just federal and state government staff, but also partners and customers who were manufacturers, CNP directors, suppliers, and association representatives from American Commodity
Distribution Association (ACDA), and SNA (formerly the American School Foodservice Association).

A Commodity Order Re-Engineering (CORE) team, representative of all constituencies in the commodity distribution process, met monthly to develop a proposal for change. Because commodities accounted for about 20% of a school district’s food needs, a primary goal of the commodity reengineering process was to make the commodity distribution processes match, as closely as possible, processes used by school districts for the other 80% of food purchases (USDA, 1999). Thus, the CORE team’s goal was to develop and implement a commodity distribution process, that was the same as or compatible with commercial procurement operations (USDA, 1999).

Food Distribution 2000 – Proposal for Change

By February 2000, the reinvention team developed a proposal for change called Food Distribution 2000: Transforming Food Distribution for the Next Millennium (FD 2000) (USDA, 2000). In FD 2000, the team presented a plan and process for efficient delivery of services and commodities to customers, in a predictable and timely manner. Demonstration projects and pilot tests such as substitution and standard yield were implemented. This new process allowed for development of new commodity value pass through systems that increased use of difficult-to-use commodities, reduced inventories held at the state level, and improved delivery allowing just-in-time delivery of commodities to schools (USDA, 2000). These changes increased industry interest in processing USDA commodities. Schools received commodity products that were more favorable to student tastes and USDA demonstration projects showed the end products were more convenient for CNP directors.
FD 2000 featured 12 problems and concerns identified by constituent groups that were targeted for the reinvention effort (USDA, 2000). An overview of those problems included:

- Commodities in forms difficult to use, such as less-processed forms, too large, too heavy, or unpopular items.
- Uneven flow or bunching of commodities as seldom the right quantity of product was available at the right time or delivered when needed.
- Unpredictable delivery that resulted in long inventory storage, extra cost, and product quality deterioration.
- Increased cost of final product as states levy a per-case or per-pound storage and delivery cost; some states charge state salaries and expenses to CNP. In some cases, schools can buy products commercially less expensively.
- Fewer bids from industry as shrinking competition due to cumbersome state and federal contracting methods, outdated or difficult specifications, low-volume, and multiple drop site deliveries to schools.

**State Administration and Value Pass Through Systems**

USDA offers bulk or a limited number of further processed commodities to state distribution agencies. State agencies offer commodity items to CNP, WIC, and a variety of recipient agencies such as qualified childcare facilities. Most of the commodities processed through the program go to schools participating in the NSLP. State administration of the commodity distribution program exists today as it did in 1939 to manage the distribution of commodity foods. This program has helped expand donated food use from a limited number of commodities to a broader array of nutritionally sound, well-accepted items while keeping
labor costs to a minimum. USDA formalized the state processing program in 1958 to permit state distribution agencies to maximize use of donated commodities.

The goal of the state commodity program is to keep commodity food costs minimal while offering well-accepted meal items (USDA, n.d.f). State distributing agencies, manufacturers, distributors, and CNP work together to offer students table-ready end products. State distributing agencies and manufacturers have learned that working together is mutually beneficial (USDA, n.d.f). The commodity distribution program becomes complicated, as each commodity item, each manufacturer, and each state may handle the same commodity item differently. With the individual and unique needs of each school district, the commodity program must remain flexible to meet the needs of an ever-changing society, to provide healthful food to children.

**Benefits of State Processing**

State distributing agencies and school food authorities found participation in the state processing program led to many benefits (USDA, 2006e). The State Processing Program Fact Sheet stated CNP directors reported commodity dollars were maximized when lower-cost bulk products were ordered and diverted to manufacturers (USDA, 2006e). Depending on the processor, certain products were stored and delivered by the distributor as needed, eliminating storage and delivery fees. Back-haul charges were eliminated as USDA vendors delivered commodities directly to manufacturers. Additionally, the variety of foods offered to students increased and labor costs and cash outlays for food preparation were reduced. For poultry products, more servings per pound of commodities were ordered based on newly legislated poultry substitution and standard yield regulations (USDA, 2003b; 2003c).
Federal policy changes that allowed alternative processes have been implemented successfully in many states. The new processes are patterned after lean manufacturing business systems. A lean business involves a process where non-value-added costs are removed from the production line, therefore, creating an efficient value stream that saves money for all segments of the business (Womack & Jones, 1996). Greater efficiencies can be gained when all segments within the system work together (Womack & Jones, 1996). NOI and ECOS are examples of systems that remove non-value-added costs that were federal policies developed as result of USDA’s reengineering effort. These programs are voluntarily adopted by states, distributors, and manufacturers.

**State Processing Options**

Three types of processor agreements are currently permitted under the state processing program: state agreement, recipient agency agreement, and master agreement. These three processing agreements allow flexibility for state agencies to make agreements with manufacturers to process commodity foods into a variety of end products. Processors entering into state or master processing agreements must ensure that the full value of the donated food contained in the finished products is returned to CNP (USDA, 2006c). USDA created alternative methods for schools to receive commodity foods. CNP directors can receive commodities as offered by USDA or have their allocation of bulk commodity diverted to a manufacturer for further processing. VPT systems were developed to credit CNP for the commodity food value.

This value can be returned to the CNP recipient agency with one of several VPT systems established by USDA and agreed upon by the state distribution agency, manufacturers, distributors, and CNP. VPT systems are implemented by manufacturers and
distributors with final decisions made by the state commodity distribution agency. These VPT systems are considered direct sales discount or indirect sales discount based on how the commodity food value is returned to CNP. Not all VPT systems are approved and available in all states.

Direct and indirect sales discount are approved systems. NOI is a hybrid version of an indirect sales discount system approved in March 2003 (USDA, 2003a). VPT methods are determined by each state commodity director, distributor, and manufacturer. These state-level stakeholders must implement the system within their organizations. NOI is available currently to CNP in 21 states; more state distribution agencies, distributors, and manufacturers implement the hybrid NOI VPT system each year (K12 Services, 2006). The three most widely used VPT methods are NOI, fee for service (FFS), and rebate (USDA, 2006c).

**Net off invoice.** NOI provides a cash discount to the district CNP by taking a net price off the commercial price of a product from the final distributor invoice. This new option maximizes use of commercial distribution and reduces storage and delivery fees. CNP receives the commodity dollar value at the beginning of the school year without completing additional paperwork to receive commodity cash credit.

**Fee for service.** The fee for service option charges the CNP for added ingredients, processing, and additional costs such as storage and delivery to process the commodity into forms specified by the CNP. The CNP is invoiced directly from the manufacturer for the product minus the value of the raw ingredient contained within the finished end product. Manufacturers accrue added costs for invoicing and CNP specified processing.
Rebate. The rebate or refund option is the VPT method whereby the CNP purchases eligible end products from a commercial distributor and applies to the manufacturer for a refund equal to the amount of commodity raw ingredient contained in the end product. CNP directors must remember to file for the refund. Often invoices are sent to the school district business administrative office rather than CNP director, who generally applies for the rebate. As a result, rebates may not always be applied for, resulting in lost resources for CNP. Manufacturers incur the added paperwork and expense of writing numerous rebate checks that add cost to the processing system.

Agriculture Support

Today, as a permanently authorized federal “entitlement” program, NSLP funds are budgeted by Congress each fiscal year. FNS administers the program at the federal level. However, in each state, the NSLP is administered by the state education agency or department of agriculture. These agencies operate the program through agreement with local school districts or other school food authorities (SNA, 2006).

FNS works closely with two other USDA agencies to obtain commodity foods for school meal programs. AMS purchases perishable products such as meat, poultry, fish, fruits, and vegetables (Group A-type commodities). The Farm Service Agency (FSA) Commodity Operations Office purchases basic commodity foods such as dairy products, cereals, grains, peanut products, and vegetable oils (Group B-type commodities) (USDA, n.d.a). Commodity entitlement and the cash reimbursement amounts vary yearly based on the Price Index of Foods Used in Schools and Institutions (USDA 2006a). The commodity reimbursement rate for SY 2005-06 was $0.1750 (USDA, 2006a). This reimbursement rate was multiplied by the school district’s previous year’s Average Daily Participation (ADP) and number of school
days to determine the commodity cash allocation for each school district. Commodity foods must be of domestic origin and be in surplus at time of purchase as determined by USDA. Bonus commodity foods also are provided and do not count against the regular commodity entitlement. Commodities are delivered to school food authorities through state designated distribution agencies.

An accomplishment of the commodity program includes use of commercial labels on commodity products (USDA, n.d.e). In the past, commodity foods, even those further processed by commercial manufacturers, were required to be packaged in USDA-labeled brown boxes. USDA now allows commercial labels on all food items purchased for its school and household programs. Transitioning to commercial labels eliminated the stigma sometimes associated with the generic USDA label, as well as the misconception that USDA commodities are not of the same quality as commercially labeled foods (USDA, n.d.e). Manufacturers now have the option to use commercial labels on all USDA food purchases.

Financial Impact of Commodity Foods

School foodservice directors facing difficult times have used a variety of expense-containment and revenue-producing strategies to try to manage school foodservice finances (U.S. GAO, 2003). For example, better planning and use of commodity foods can reduce the amount of commercial food purchased, which can reduce program expenses. Inventory management costs declined as less food inventory was warehoused. CNP directors reported labor-saving measures when commodities were processed into fully cooked forms that required little preparation and reduced labor expenses (U.S. GAO, 2003). In turn, this created a consistent product in forms desired by students that could lead to greater program satisfaction and increased student participation.
Additional commodity cost savings and nutritional improvement strategies identified in the literature (Story, Kaphingst, & French, 2006) included serving reimbursable meals that appealed to students and more healthful a la carte items offered to encourage students to eat more healthfully. For this change to occur, competitive foods sold outside the cafeteria would be limited or eliminated. Increased school lunch participation, which increased revenue, resulted when competition to the reimbursable school meal was eliminated (Story, Kaphingst, & French, 2006). Additional funding for school meal programs could eliminate the need to generate funds through sale of competitive foods. SNDA II (USDA, 2001a) found that although most schools received USDA-donated commodity foods and some states contributed supplemental funds, federal reimbursements did not fully cover meal costs. Therefore, finding ways to reduce unneeded costs for the meal program will benefit CNP and the children who participate in them.

**Food Choices Associated with Greater Nutritional Value**

In SY 1996-97, USDA began a series of studies to look into elements of reform for CNP. This collection of studies was called the School Meals Initiative. As result of the series of reports, stringent requirements for the nutritional content of school meals were established (USDA, 2001b). Stitzel (2004) and the American Dietetic Association (1996) noted the increasing number of children who are overweight or obese has led many to question the role and importance of school meal programs and their environments in both contribution to and prevention of obesity.

These claims led USDA to conduct an environmental scan of published studies that connect school meal programs to childhood overweight and obesity. This recent USDA FNS review of 144 published studies shows a strong inverse association between socioeconomic
status and obesity in women, and an inconsistent relationship in men and children (Linz, Lee, & Bell, 2005). An expert panel concluded that it is necessary to separate the effects of poverty and socioeconomic status from potential effects of food assistance to determine the relationship between obesity and program participation. The research challenge is that poverty is highly correlated with program participation, making it difficult to separate their independent effects. Existing research provides inconsistent evidence of an association between the four major nutrition assistance programs and obesity, and no evidence that program participation causes obesity (Linz, Lee, & Bell, 2005). Levendahl and Oliveira (1999) found participation in a food assistance program affected the diet in two ways: 1.) increased the quality of food consumed and 2.) led to the intake of foods with higher nutritional value.

**Nutrition Improvements**

USDA’s commodity distribution division is making it easier and more efficient for CNP to order and receive commodity products (USDA, 2006a). CNP reported favorable changes in commodity programs, specifically the partnership between USDA and Department of Defense (DOD) Fresh Fruit and Vegetable Program that provides a limited amount of fresh produce to CNP. CNP directors have increased access to fresh fruits and vegetables through a convenient and easy-to-use electronic on-line system (USDA, 2006a). State directors and CNP directors who used the program reported being extremely pleased with quality, condition, and appearance of produce and reported deliveries were frequent, on time, and at a reasonable cost. A wide variety of popular fruits and vegetable were offered. As with all commodity programs, state directors had the option to limit what was offered to CNP in their state (USDA, 2006a).
Additionally, USDA provides fresh fruits and vegetables to 25 schools across the country at no cost to the school meal program. Some of these school buildings were part of a pilot project that became a permanently funded program.

Despite positive reports, commodity food problems remain. Gregoire and Sneed (1993) found that among a group of school foodservice directors who were brought together to identify barriers related to procurement and implementation of the Dietary Guidelines, there was no consensus regarding the statement “many commodities did not meet Dietary Guidelines.” This could be due to state-level administration of the federal commodity program that creates variations in commodity-processed foods for each state. CNP directors in some states may have the ability to specify how commodities are processed, resulting in commodity products that meet a desired nutrition profile that more closely follows the Dietary Guidelines. CNP directors continue to request commodities low in fat, saturated fat, and trans fatty acids (USDA, 2006b). VPT options offered in some states make diverting commodity foods easier, and therefore CNP directors have much wider variety of commercially processed foods available. Among those options are reduced-fat, reduced-sodium, and whole grain products. USDA is working diligently to meet the nutrition regulations for reduced sodium, reduced fat, zero grams of trans fat, and increased amount of whole grains required of CNP for commodity foods (USDA, 2006b).

Story, Kaphingst, and French (2006) stated that schools could play an important part in a national effort to prevent childhood obesity. More than 95% of American youth age 5 to 17 are enrolled in school, and no other institution has as much continuous and intensive contact with children during their first two decades of life. Schools can promote good nutrition, physical activity, and healthy weights among children through healthful school
meals and foods, physical education programs and recess, classroom health education, and school health services.

**School Meals Initiative and Dietary Guidelines**

The SMI legislation, passed in 1994, provided a comprehensive, integrated proposal to ensure that school meals are healthy (USDA, 2001b). This continuous improvement plan called for school meals to meet nutrition guidelines, along with nutrition education to teach and motivate children about healthy food choices and training for school foodservice professionals. A U.S. GAO report on school meal program revenue and expenses (2003) reported school lunches must meet the Dietary Guidelines for Americans, which recommended on a weekly basis no more than 30% of an individual’s calories come from fat and less than 10% from saturated fat. Regulations also established a standard for school lunches to provide one-third of the Recommended Dietary Allowances of protein, Vitamin A, Vitamin C, iron, calcium, and calories. When schools serve meals that do not comply with federal nutrition requirements, program regulations allow states to withhold federal reimbursements if the schools have not been acting in good faith to meet the requirements. However, USDA officials questioned whether holding back federal reimbursements offers a practical or realistic solution because of the possibility of program cutbacks or closure and the effect on the students, especially those receiving free or reduced-price lunches.

**Nutrition Content of Commodity Foods**

Nutritional contributions of commodity foods have been questioned for years although little research had been conducted. Story, Kaphingst, and French (2006) stated that changes were needed in the commodity food program. These researchers recommended that USDA revise its specifications to procure commodity foods that are consistent with those
outlined in the Dietary Guidelines. They also recommended the commodity program should offer more fresh produce and healthful lower-fat foods and make more connections with local farmers.

Since the release of the 2005 Dietary Guidelines for Americans, school meal programs are encouraged to decrease sodium and trans fatty acids and increase whole grains. A much larger amount and variety of fresh fruits and vegetables are encouraged and are now made available to all schools through the commodity program DOD Fruit and Vegetable Program and the recently expanded Fruit and Vegetable program in the selected 25 school buildings (USDA, 2006b). USDA’s commodity programs are making efforts to improve nutrition content of commodities. USDA’s April 2006 Commodity Update newsletter (USDA, 2006b) outlined potential changes in commodity foods to meet the 2005 Dietary Guidelines for Americans. Featured changes included reduced sodium in canned vegetables, increased whole grain offerings, and reduced trans fatty acids. The increased availability of fresh fruits and vegetables, availability of reduced sodium products, and increased availability of whole grain commodity offerings evolved as result of feedback received from CNP directors on acceptability of commodity programs (USDA, 2006b). Many of the changes were initiated through USDA’s business process reengineering (BPR) and Food Distribution 2000 commodity program transformation.

**Summary**

Improvements to the commodity program continue to be introduced for the 2006-07 school year (USDA, 2006b). Utilization of current technology with on-line communication and Website development represents great strides toward increased communication among USDA, state agencies, CNP directors, and manufacturers involved in the commodity
program (USDA, n.d.e). Limitations on the state level may impede progress in some states. Research has demonstrated cost savings by removing non-value-added expenses in the commodity supply chain (Womack & Jones, 1996). Funds saved by removing non-value-added costs can be redirected to the CNP. Nutrition improvements are needed as expressed by CNP directors to meet the Dietary Guidelines and ever-changing state nutrition standards. To accomplish this, cooperation between federal and state programs is needed.

Although the commodity program has changed, there is room for continued improvement and consistent implementation nationwide. Future program changes could continue to improve cost and nutritional value of commodity foods for America’s schoolchildren. Thus, it is important to explore the cost and nutritional value of commodity foods. By eliminating unneeded costs in the commodity program, CNP can use additional money to improve or enhance child nutrition programs. With this goal, both USDA and school children benefit.

There may be many costs associated with the use of commodity foods. As indicated in the review of literature, school environment and students have changed resulting in a commodity program that no longer met the need of CNP directors. Research is needed to determine use of commodity foods and CNP director perceptions of the value of commodity foods.

As the history of the commodity program indicated, state agencies control decisions at the state level that determine how commodities are processed and distributed within each state. Since the state distribution agency determines the type of commodities and the systems used in each state, more research is needed to determine how state agencies make decisions on commodities and processing systems. As systems are approved by USDA based on results
of pilot and demonstration projects, CNP directors and state agencies should be informed of new options on a routine basis. Research is needed to determine if NOI is a VPT system preferred by CNP directors.

The School Meals Initiative and Dietary Guidelines for Americans have had an impact on the school meal program as USDA has established nutrition guidelines for school meals. Since all foods must meet these nutrient guidelines established for the week, commodity foods should comply with these nutrition guidelines. Research is needed to determine how closely commodity foods meet nutrition guidelines required of school meals and perceptions of CNP directors on the nutrient content of commodity foods.
CHAPTER 3. METHODS

Study Sample

The study sample was comprised of CNP directors from 8 states. Four states used net off invoice (NOI) as a value pass through (VPT) system for poultry and potatoes, and the other 4 states did not use NOI as a VPT system for poultry and potatoes as of July 2006. States were purposively selected based on largest commodity volume, availability of electronic mailing lists, and number of CNP directors to obtain a similar sample size in both NOI and non-NOI groups. The 4 NOI states in the study were Florida, Illinois, Pennsylvania, and Texas. The 4 non-NOI states were Georgia, Massachusetts, Missouri, and Washington.

Email address lists were obtained from the state CNP director, commodity director, or state School Nutrition Association affiliate. Email lists were edited to contain only CNP directors as some state commodity lists contained recipient agencies such as correctional facilities and residential child care institutions that were excluded from the study sample. All CNP directors in the 8 states were sent electronic surveys to eliminate sample bias as a threat to validity. A total of 3,191 surveys were emailed, with 1,674 sent to CNP directors in states that use NOI and 1,517 to CNP directors in states that do not use NOI. There were 323 returned undeliverable email letters that were subtracted from the total number of surveys sent. The final study sample totaled 2,868.

A letter explaining the study and containing an Internet address link to the commodity survey was emailed to the state director or commodity director in the states included in the study. These directors were told that they were provided with the survey for informational purposes and asked not to complete the survey.
Research Design

A survey research design that used qualitative and quantitative research methods was used to gain information about the use of commodity foods. A focus group was conducted to learn about challenges CNP directors face with cost and use of commodity foods and to provide information to aid in development of the questionnaire. A questionnaire was developed, pilot tested, and emailed to CNP directors to determine commodity use and processing systems used.

Questionnaire Development

A literature review and a focus group were conducted prior to developing the questionnaire to ensure that important aspects of commodity program costs were included. Questions were generated from the common themes that surfaced as result of the focus group. USDA’s commodity distribution staff identified the largest volume commodity foods, chicken and potatoes, that were used in the research.

Literature Review

A literature review was conducted prior to developing the questionnaire to ensure that important aspects of costs and nutrient content commodity program were included in the survey. Limited research exists on the use, cost, and nutrient content of the commodity food program other than USDA and U.S. GAO research.

Conversations with USDA

Calls were made to USDA’s commodity distribution staff as a professional courtesy to inform staff of the survey and gain insight on program history; and to identify key milestones involved in commodity distribution programs, recent program changes, largest volume commodity states, states using NOI, and generate support for the research.
Commodity staff was sent a courtesy copy of the questionnaire for informational purposes. A briefing was requested with USDA contacts to share research results upon completion of the study.

**Focus Group**

**Process.** A focus group was conducted at the School Nutrition Association (SNA) Child Nutrition Industry Conference (CNIC) in January 2006 to identify key issues, current practices, strengths, and challenges of the commodity processing system and identify non-value costs of using commodity foods. A convenience sample of 8 school foodservice directors was invited to participate in the focus group. Focus group participants represented both large and small school districts from a geographic cross section of the country. Six states were represented in the focus group: Florida, Indiana, Missouri, Ohio, Washington, and Wisconsin.

Focus group participants responded to a few questions prior to attending the focus group. The responses were used to provide background on the participants to ensure they processed USDA commodities and that NOI and non-NOI states were represented. A Focus Group Discussion Guide (Appendix A) was developed to gather information and guide the 90-minute discussion. The Iowa State University Office of Research Assurance and Institutional Review Board approved the focus group protocol and discussion guide prior to the focus group (Appendix H).

**Results.** Focus group results (Appendix B) were used to develop the questionnaire for the study. Description and note-based analysis as explained by Krueger were used to analyze focus group results (Krueger, 1998). Krueger’s (1998) process of axial coding field notes was used to determine common themes that were used to develop the questionnaire utilized in the
study. Common themes included left over entitlement dollars and food inventory, cost of storage and delivery, waste of unused commodity food and dollars, food in unusable forms, end of year deliveries, and nutrition content of commodity foods.

**Written Questionnaire.** A three-part, 44-item questionnaire (Appendix C) was developed for CNP directors. Part 1 focused on the cost of using commodity foods. Closed and open-ended questions determined if commodity dollars or food inventory remained at the end of the school year 2005-06 and CNP directors were asked to indicate why those dollars or food inventory remained. Participants were asked which VPT system they preferred to use, which VPT system was used for chicken and potatoes, and what percent of their chicken and potato allocations was diverted to manufacturers for further processing. Questions to assess time and staff used for commodity management each month were included in this section. In addition, questions were included to identify which budget (CNP, school district general fund, or state commodity program) assumed storage, delivery, administrative, and wasted or unused commodity food costs. Questions were included to assess CNP director attitudes toward cost and benefit of diverting bulk commodities to processors. A 6-point rating scale (1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree) was used; a neutral response was eliminated.

Part 2 of the survey focused on nutrient content of commodity foods. Questions in this section assessed CNP director attitudes toward the cost and nutrition benefits of diverting bulk commodities. The 6-point rating scale described above was used for responses.

Respondents were asked to list the brand and code number for the chicken and potato product that they used most for their commodity diversion. CNP director’s responses from each of these two categories were reviewed to determine if there were common responses.
Those CNP directors who responded to the question most often reported a brand and not a product code. The most often reported chicken nugget and crinkle cut French fry product was selected for the nutrient analysis. If nutrient information was not available, the next product was selected from among the product codes reported and used to report the nutrient content of commodity processed chicken and potato products.

Part 3 of the survey determined state, school district enrollment, average daily participation, foodservice budget, and commodity Planned Assistance Level (PAL). Other questions explored information about the survey respondent such as length of time in the director position, education, computer use in ordering commodities, and amount of time spent with commodity ordering, processing, and tracking. Respondents were asked questions to determine the type of food preparation and facilities in the district and if the school district used a buying cooperative, management company, or group purchasing organization. The questionnaire concluded with an open-ended question requesting any additional comments participants had regarding cost, nutrient content of commodity foods, or NOI.

To ensure clarity of survey questions and that key issues regarding commodity cost and nutrient content were included, the first draft of the survey was emailed to a state commodity director and CNP director from a state not in the study sample. Slight revisions were made in terminology. Next, a pilot test was conducted with 26 CNP stakeholders. The pilot test group consisted of the 8 focus group participants from the January CNIC commodity focus group and 18 PhD students, most of whom are or have been CNP directors and are part of Iowa State University’s Child Nutrition Program Leadership Academy. This pilot test group represented CNP directors from states using NOI and not using NOI. Revisions were made to the survey based on comments from the pilot test. The Iowa State
University Office of Research Assurance and Institutional Review Board approved the research study protocol and questionnaire prior to data collection (Appendix H).

**Data Collection**

Survey data were collected from CNP directors via a survey administered utilizing Survey Monkey, an Internet software survey tool (Survey Monkey, LLC, 2006). A letter (Appendix D) that explained the purpose of the research, importance of participation, explanation of study participant anonymity, and an Internet address (direct link to the on-line survey) was emailed to the study sample as recommended by Dillman (2000). Instructions were included in the letter that explained how to access the on-line survey. Letters were emailed on Tuesday of the first week of August to reach CNP directors before the beginning of the school year.

A second letter (Appendix E) that contained the survey link was emailed to the study sample a week after the first survey letter as recommended by Dillman (Dillman, 2000). The second email letter thanked those who had completed the survey and encouraged those who had not to complete the survey, as their thoughts were important to CNP and commodity programs in schools. As Dillman (2000) recommended, a third and final letter (Appendix F) thanked those who had completed the survey, contained an explanation of the study and participant anonymity, and instructions on how to access the commodity survey was emailed to the study sample on Monday of the third week of August.

As recommended by Dillman, to enhance response rate, surveys were emailed with participant name placed as a blind carbon copy (bcc) so study participants would see only their name on the email to make it appear that the message was sent to the individual rather than a mass email list (Dillman, 2000). The email was sent from the researcher’s university
email address through the bulk email service at Iowa State University. After three weeks, data were collected.

**Nutrient Analysis**

Manufacturer commodity product nutrient information was not available for all products reported as used by CNP directors on the questionnaire; therefore, nutrient information was reviewed from similar commercial chicken and potato items. USDA commodity product nutrition specifications were accessed from USDA Food Nutrition Service (FNS) Food Distribution Division (FDD) website. The commodity products breaded chicken nuggets USDA A519 and crinkle cut French fries USDA A210 were used for this analysis. Commodity items selected for this comparison, USDA A519 and USDA A210, were determined by most popular items overall, as indicated by David Brothers, USDA (personal communication, June 22, 2006).

**Data Analysis**

After three weeks, 693 surveys were completed. Survey data were imported to SPSS, version 13.0 (SPSS Inc., 2004). SAS, Version 9.1 (SAS Institute, 2003) also was used. Data were compiled, checked for completeness, and analyzed. Data analysis steps included compiling the number of responses to determine if parametric tests would be used. Means, distribution, frequency, and standard deviations were assessed. Statistics were used to test confidence intervals and \( t \)-tests were used to compare CNP director attitudes, in NOI states and non-NOI states, toward nutrient content and diverting commodity foods. Chi-square and correlations were used for categorical variables to determine CNP director’s use, diversion of commodity foods, and use of ECOS in NOI and non-NOI states. A probability of \( p \leq 0.05 \)
was used for all tests of significance. Statistical analyses and results for all research questions are included in Appendix G.
A manuscript prepared for submission to *The Journal of Child Nutrition & Management*

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**Abstract**

Commodity foods are an integral part of Child Nutrition Programs (CNP). United States Department of Agriculture (USDA) purchased over 1.1 billion pounds of commodity food valued at over $800 million for CNP in school year 2005 (USDA, 2006a). Commodity programs serve a dual purpose to support agricultural producers and provide food to schoolchildren (USDA, 2006a). Today’s commodity distribution program was established during the 1930s federal work and food assistance programs.

Declining use of commodity programs by CNP throughout the 1990s led USDA to conduct a Business Process Reengineering (BPR) to renovate the program to increase utilization. This BPR resulted in commodity program improvements for schools, manufacturers, distributors, federal, and state government (USDA, 2000). These changes have been well received but are not universally used in all states.

The purpose of this paper was to provide a historical review of the commodity program. Based on this review, a need for research and future changes to the program was identified. There is a need to remove non-value costs associated with commodity distribution and increase nationwide use of streamlined commodity distribution systems. A need also exits to educate state distribution agencies, CNP directors, and manufacturers on cost effective commodity practices. Since limited research currently exists on commodity distribution
programs, further study is needed to develop cost effective, nutritious products that are available through commercial distribution process.

**Introduction**

The National School Lunch Program (NSLP) is a federally assisted meal program that provides nutritionally balanced, low cost lunches to school children (USDA, n.d.a). Commodity foods are provided at different reimbursement rates each year. In SY 2005-06, CNP received $0.175 in commodity food value for each qualifying lunch served that meets established nutrient guidelines established by USDA (USDA, 2006a). Schools participating in the NSLP must offer free or reduced-price lunches to eligible children and meals served must meet federal requirements to qualify for funding (USDA, 2003a). During SY 2005-06, schools received maximum cash reimbursement rates of $2.49 for each qualifying free lunch served, $2.09 for each reduced price lunch, and $.30 for each full price lunch served (USDA, n.d.b). These funds are used for administration of NSLP.

According to the School Nutrition Association ([SNA], 2006), school foodservice operators purchased $7.2 billion in food products nationally, which accounted for 15% of the $47.1 billion non-commercial foodservice market for SY 2005. The school segment ranked as the third largest food purchaser in non-commercial foodservice (SNA, 2006). SNA (2006) reported USDA commodity foods account for 20% of the food dollars used by CNP.

**History of the Commodity Food Program**

The commodity distribution program began during the 1930s economic depression that brought widespread unemployment for many American families. With no means to support their families, many sought help through public assistance programs (Gunderson, 1971). The earliest federal aid provided labor for school lunch programs.
Federal Agriculture Programs

During the depression, farm production created surplus food supplies without adequate markets. Limited family income left schoolchildren hungry and the danger of childhood malnourishment became a national concern. The Federal Surplus Commodities Corporation was created to procure and distribute surplus foods to schools and needy families. In 1936, Section 32, of Public Law 74 320 approved by Congress allocated 30% of customs receipts each year to encourage domestic consumption of agriculture commodities, and schools were a major distribution channel (Gunderson, 1971). This became the primary source of funds for commodity foods for CNP.

State Administration of Federal Programs

During the early 1940s, state commodity directors were hired by the federal government to expand CNPs in each state (Gunderson, 1971). According to Gunderson, this state commodity director worked with state and local school authorities, ordered food, arranged proper warehousing throughout the state, and set up and maintained adequate records to account for receipt and distribution of all commodity foods shipped into the state. Gunderson (1971) noted the director reported to the federal government from time to time. In 1943, state agencies assumed full administrative and financial responsibilities of the commodity food program and officially became known as distributing agencies (Gunderson, 1971).

National School Lunch Program

During the draft of World War II, many young men reported for military duty unable to serve due to lack of proper nutrition. President Truman believed that providing a healthy lunch at school could prevent malnutrition and poor eating habits. In 1946, to support
existing and expansion of school lunch programs, the National School Lunch Act was passed. Throughout the next 40 years commodity programs continued to expand through NSLP.

**School Commodity Programs Decline Throughout 1980s and 1990s**

The *School Food Purchase Study: Final Report* (USDA, 1998) showed that donated commodities declined from 30% of the food dollars spent in NSLP in school year (SY) 1984-85 to 13% in 1996-97. This study indicated a shift from donated commodities to commercially purchased foods. The study also reported that of foods purchased for CNP only 13% was donated commodities, 4% was processed foods containing donated commodities, and 83% was purchased commercially (USDA, 1998). The school environment had changed during the 1990s. Superintendents placed emphasis on financial performance, at the same time CNP directors faced increased labor costs and decreased supply of workers. In addition, student taste preferences changed and the popularity of heat-and-serve foods and availability of processed items increased (USDA, 2000). These factors affected CNP directors’ attitudes toward commodities and expectations of the commodity program (USDA, 2000).

Food preferences and foodservice had changed (Enns, Mickle, & Goldman, 2003). This *Trends in Food and Nutrition Intake by Adolescents in the U.S.* study indicated food consumption among teens 12 to 19 years of age had shifted. Teen food intake included more soda, crackers, popcorn, pretzels, corn chips, and fried white potatoes, whereas consumption of milk, green beans, corn, peas, bread, and rolls decreased.

The Institutes of Medicine (IOM) cited cultural and environmental changes among reasons for a shift in eating trends over the past three decades (IOM, 2005). Although changes had been made in USDA’s commodity program, changes in food trends, foodservice
staffing, space, and equipment resulted in schools receiving commodity foods in forms difficult to use, and products students would not eat (USDA, 1999). CNP directors faced added challenges of a commodity program that included unpredictable deliveries or deliveries made when school was not in session, limited number of manufacturers participating, and excessive paperwork. These barriers led to the decreased use of donated commodities (USDA, 2000).

USDA’s Commodity Improvement Council (CIC) discovered CNP directors changed procurement practices toward economical commercial food choices. The indirect cost of using commodity foods became more expensive than similar commercially available products that students preferred over commodity foods offered (USDA, 2000).

The constituent groups convened by the CIC identified 12 barriers to using commodity foods. These barriers led to targeted issues for the reinvention effort (USDA, 2000), and included:

- **Unpredictable delivery**—resulted in long inventory storage, extra cost, and product quality deterioration.
- **Unusable forms**—commodities in forms difficult for some schools to use, such as less-processed foods, unpopular items, too large quantity, or heavy boxes.
- **Uneven flow or bunching of commodities**—seldom the right quantity of product was available at the right time or delivered when needed.
- **Increased cost of final product**—states levy per-case or per-pound storage and delivery fees.
• Lack of industry processors--shrinking competition due to cumbersome contracting methods, outdated or difficult specifications, and low-volume deliveries to schools.

Process Improvement

USDA’s CIC ordered a Business Process Reengineering (BPR), which was the largest ever departmental transformation undertaken by a government agency. In this process, program changes were designed to be dramatic, quick, and fundamental (Hammer & Champy, 1993). Changes involved federal and state government staff, manufacturers, CNP directors, suppliers, American School Food Service Association (now known as School Nutrition Association), and American Commodity Distribution Association (ACDA) representatives.

The BPR resulted in dramatic changes and improvements in the commodity program that were outlined in Food Distribution 2000: Transforming Food Distribution for the Next Millennium; A Proposal for Change (USDA, 2000). The BPR created a USDA environment that was open to explore alternative methods for schools to receive commodity foods, remove non-value costs, provide foods desired by students, and meet nutrition guidelines.

The BPR recognized the need to maximize commodity assets. “Each dollar spent on unnecessary storage or other non-value added costs and each dollar spent on food that children will not eat is a dollar wasted” (USDA, 2000). Maximized use of commodity entitlement funds allowed CNP directors to invest in other areas such as equipment, merchandising, or purchasing higher quality foods (USDA, 2000). A U.S. Government Accounting Office report (GAO, 1996) showed offering brand-name items led to increased student participation, school lunch, and a la carte sales, and decreased plate waste.
State Administration and Value Pass Through Systems

USDA offers bulk or a limited number of further processed commodities to state distribution agencies. Once commodity food is made available to states, administration and distribution becomes the responsibility of the state agency. The State Processing Program allows states and CNP directors to contract with commercial food manufacturers to convert bulk or raw commodities into more convenient ready-to-use end products (USDA, 2006b). Some state agencies manage a commodity warehouse and distribution system.

The goal of the State Processing Program is to keep commodity food costs minimal while offering well-accepted meal items (USDA, 2006b). USDA reported State Processing Program benefits included cost savings when bulk products were ordered and diverted to manufacturers. Reduced labor costs due to less time required for food preparation and reduced storage costs were reported as benefits of participation (USDA, 2006b).

Processors entering into state or master processing agreements must ensure that full value of the donated food contained in finished products is returned to CNP directors. Commodity value is returned through one of several VPT systems established by USDA and agreed upon by the state distribution agency, manufacturers, and distributors. The most widely used VPT systems are net off invoice (NOI), fee for service (FFS), and rebate (USDA, 2006c). Not all VPT systems are used by all manufacturers and distributors and not all are approved and available in every state. State commodity directors determine the VPT systems that will be used for each commodity category in their state. Since 2003 when NOI was approved, 21 states have implemented the system (K12 Services, 2006).

Electronic Commodity Ordering System (ECOS) is another system that was implemented as result of commodity reengineering process. ECOS allows CNP directors to
place and track commodity orders through USDA’s Internet website. In some states, ECOS is used by the state agency staff only. Some states allow CNP directors to use ECOS to place orders to the state agency; others only allow access to ECOS to view commodity information. Use of ECOS, like NOI, is determined by the state commodity director’s office. Currently nine states have permitted CNP directors to place commodity orders on ECOS, and 25 states allow CNP directors access to view commodity activity on ECOS.

NOI and ECOS are examples of two systems that have been implemented to remove non-value costs. NOI allows just-in-time delivery for CNP directors, eliminating the need to store excess commodity foods. ECOS eliminates administrative time spent on paperwork. Although these programs eliminate non-value costs, participation is voluntary and is the decision of the state agency.

Nutrition and Commodity Foods

Limited research exists on nutritient content of commodity foods. Gregoire and Sneed (1993) and Conklin (1995) identified barriers to meeting dietary guidelines related to food procurement. These studies reported CNP directors found it difficult to meet the dietary guidelines using commodity foods. Now with value pass through options like NOI, CNP directors have greater flexibility to order commercial foods, select foods that meet their menu and nutrition guidelines, and receive commodity credit.

Conclusions and Recommendations

Historically the commodity distribution program was successful in meeting its goals to provide support for agriculture producers and food for schoolchildren. Studies indicate that commodity use declined and children were not being served as the program became inefficient for schools and manufacturers. Since commodities account for about 20% of a
school district’s food costs, one of the goals of the commodity reengineering process was to make commodity processing and distribution match as closely as possible the processes used by school districts for the other 80% of commercial food purchases. USDA predicted efficiencies would result for manufacturers and school districts when all food products could be procured from the same channel, or a compatible channel (USDA, 1999). USDA’s dramatic changes brought about by the multi-agency review resulted in new processing and distribution systems that have potential to improve commodity programs (USDA, 2003b).

Federal regulations provide various new processing systems and on-going demonstration projects to increase program efficiency. State distribution agencies determine their system, which provides latitude to accommodate local needs. Although many new efficient systems are available, some states choose to continue with traditional, and often inefficient, systems. ECOS and NOI are examples of new cost and time saving systems not used by all states that could provide great benefits at the school district level.

USDA is to be commended for implementing program efficiencies, and a willingness to explore new processing and distribution systems and make aggressive changes to improve commodity programs. Research is needed to determine cost savings and efficiencies between states using new systems and states not using these new systems. Research in these areas may encourage future aggressive changes to improve commodity distribution.

To meet goals of the commodity food program, emphasis must remain on the nutrition and food preferences of today’s students. As manufacturers continue to develop nutrient dense, on-trend products, those products should be offered through commodity processing. USDA’s commodity program has decreased sodium, total fat, and \textit{trans} fatty acids from some commodity foods while increasing whole grain offerings (USDA, n.d.c).
This is a positive direction, although balance between nutrition guidelines and student satisfaction and participation should be the goal.

Equal emphasis placed on children and producers will strengthen USDA’s commodity distribution program. It appears USDA is willing to work with all involved constituents of the commodity program to ensure a dynamic program to support producers, program operators, and children. It may be the beginning to a new era of commodity foods in CNP.

The following recommendations are designed to improve commodity programs:

- Reinstate the Commodity Improvement Council to meet biannually to evaluate progress on commodity program improvements and recommend research. Include constituents from all aspects of commodity procurement, ordering, processing, delivery, end user, government, school district, and industry.

- Develop a nationwide five-year plan to implement NOI as a value pass through system in all states. This value pass through system allows schools just-in-time delivery of commodity foods in forms their students prefer.

The following recommendations provide direction for further commodity program research:

- Research is needed to quantify the cost of using commodity foods and cost savings based on use of various value pass through systems.

Research is needed on nutrition content of commodity foods that are provided by USDA and those further processed and distributed through commercial channels.
References


CHAPTER 5. RESEARCH MANUSCRIPT I: USE OF COMMODITY FOODS AND NET OFF INVOICE AS A VALUE PASS THROUGH SYSTEM FOR COMMODITY PROCESSING IN CHILD NUTRITION PROGRAMS

A manuscript prepared for submission to The Journal of Child Nutrition & Management

Barbara Jirka and Jeannie Sneed

Introduction

The United States Department of Agriculture’s (USDA) commodity distribution program was designed to serve a dual purpose: to support American agriculture and provide nutritious food for the nation’s schoolchildren (USDA, 2000). Commodity foods are a valuable asset for school meals programs. During school year (SY) 2005, USDA spent over $800 million to purchase over 1.1 billion pounds of food commodities for Child Nutrition Programs (CNP), that were distributed to over 94,000 public and private non-profit schools providing meals to students (USDA, 2006a).

Commodity foods are provided at various rates each year to school food authorities (SFA). In SY 2005-06, SFA received $0.175 in commodity food value for each qualifying lunch served in the National School Lunch Program (NSLP) (USDA, 2005b, 2006a). In addition, schools also may receive "Bonus Commodities” that may be available from surplus agricultural supplies. According to federal law (7 Code of Federal Regulations [CFR] § 250) commodities must be used by CNP directors in NSLP; they cannot be sold, disposed of, or given away (USDA, 2002).

Commodities supplement cash reimbursements CNP receive for the NSLP. During SY 2005-06, schools received maximum cash reimbursement rates of $2.49 for each qualifying free lunch served, $2.09 for each reduced price lunch, and $.30 for each full-price lunch served (USDA, 2005a).
School foodservice operators purchased $7.2 billion of food, which was 15% of the $47.1 billion non-commercial foodservice market in 2005 (SNA, 2006). The primary and secondary schools segment ranked as the largest food purchaser in the non-commercial segment, behind vending and business and industry. SNA (2006) estimated that USDA commodity foods account for 20% of the food costs of CNP.

Managing food costs to ensure quality and optimize financial performance has been reported as a challenge for many school foodservice directors (Hwang & Sneed, 2004). Efficient use of commodity foods can decrease dollars needed to purchase commercial food products for CNP (USDA, 2000). A study conducted by USDA’s Economic Research Service (ERS) suggested improving the selection of commodity foods might be a strategy to decrease plate waste in CNP (Guthrie & Buzby, 2002). This study also noted USDA’s efforts to improve the nutritional profile and acceptability of commodity foods (Guthrie & Buzby, 2002).

Trends indicate that use of commodity foods by schools declined from 30% of total foods used in NSLP in SY 1984-85 to 13% in 1996-97 (USDA, 1998). Over this 11-year period, the 17% decrease in commodity food use indicates school food purchasing practices have changed (USDA, 2000). According to the USDA School Food Purchase Study conducted in SY 1996-97, 83% of food purchased for CNP was purchased commercially, 13% was donated by USDA, and 4% was processed food containing donated commodities (USDA, 1998).

Federal regulation 7 C.F.R. § 250 (USDA, 2002) provided that State Processing Programs managed by state distributing agencies are responsible for the distribution of commodity foods to CNP. State Distribution Agencies also arrange for further processing of
donated foods by commercial processors to convert bulk or raw USDA commodities into more convenient ready-to-use end products. These agencies determine which processing and value pass through systems will be used in the state and if further processing will be managed by each CNP director, or the state agency (USDA, 2006b). Although changes to improve the commodity program have been implemented by USDA, they are voluntarily adopted and used by state agencies.

According to *Food Distribution 2000* (FD 2000) (USDA, 2000), the commodity program has grown and improved over the years; however, improvements have not kept pace with changes in the food industry, schools, technology, and consumer preferences. The Commodity Improvement Council; formed in 1998 by four USDA agencies, identified a variety of problems in the commodity program (USDA, 2000). Problems continue to exist, such as increased cost of the final product, fewer bids from industry, unpredictable USDA commodity deliveries, shipments bunched all at one time (often at the end of the school year), and products in forms difficult to use (USDA, 2000). Fewer product bids and declining number of manufacturers participating in the commodity program was identified as a barrier in the commodity program due to unrealistic regulations and expenses involved in commodity processing (USDA, 2000).

In addition, states responsible for distribution of the commodity foods have imposed a variety of local policies and procedures that add cost and delay delivery of commodity foods. Lack of consistent state commodity systems of ordering, distributing, and tracking commodity credit, known as value pass through (VPT) systems, are a challenge for USDA, state commodity directors, manufacturers, distributors, and CNP (USDA, 2000).
Commodity value is returned to CNP through one of several VPT systems established by USDA and agreed upon by the state distribution agency, manufacturers, and distributors. The most widely used VPT systems are net off invoice (NOI), fee for service (FFS), and rebate (USDA, 2006b). Not all VPT systems are used by all manufacturers and distributors, and not all are approved and available in all states. State commodity directors determine the VPT systems that will be used for each commodity category in their state.

NOI is available for commodities that use standard yield, a process that guarantees manufacturers return 100% of the commodity food back to CNP directors in the form of finished end products. Chicken and potatoes have high production losses that cause manufacturers to purchase food to make up production loss (USDA, 2006b). For some manufacturers, use of standard yield and NOI, removes costs from other segments of the manufacturing and administrative supply chain that create a net cost savings greater than the cost of added food product. NOI allows just-in-time delivery for CNP directors, eliminating the need to store excess commodity foods. CNP directors receive commodity credit immediately upon delivery, eliminating administrative paperwork burden and cost (USDA, 2006b). Removing non-value costs from the entire manufacturing system, from procurement and manufacturing through delivery and end product use, is what Womack and Jones (1996) call lean thinking. This process developed by Japanese industry to banish waste from corporations and develop a more efficient system assesses the entire value stream of manufacturing and distribution (Womack & Jones, 1996).

Electronic Commodity Order System (ECOS) available to state agencies to streamline commodity ordering and monitoring was implemented in 2004 to serve as a unified resource for commodity ordering for USDA, state agencies, manufacturers, and CNP directors. NOI
and ECOS are examples of programs that increase efficiency and cost-effectiveness of the commodity program. These programs have been tested in pilot and demonstration projects throughout the country. These cost-saving programs are available to all state processing programs, manufacturers, and distributors, although not adopted by all state agencies. Currently, 21 states have implemented NOI (K12 Services, Incorporated, 2006) and 9 states allow CNP directors to order commodities on ECOS.

The purpose of this research was to examine the current use of commodity foods, NOI, and ECOS in CNP. Limited research exists related to the use of commodity foods and NOI. Research examining current commodity distribution practices is needed to demonstrate efficiencies and convenience associated with the use of commodities.

Methods

Study Sample

The study sample was comprised of CNP directors from 8 states, 4 that used NOI as a VPT system for poultry and potatoes and 4 that did not use NOI as of July 2006. States were purposively selected based on largest commodity volume, availability of electronic mailing lists, and number of CNP directors to obtain a similar sample size in both NOI and non-NOI groups. The 4 NOI states in the study were Florida, Illinois, Pennsylvania, and Texas and the 4 non-NOI states were Georgia, Massachusetts, Missouri, and Washington.

Email address lists were obtained from the state CNP director, commodity director, or state School Nutrition Association (SNA) affiliate. All CNP directors in the 8 states were sent a letter explaining the study that contained an embedded internet address that connected the CNP director directly to the questionnaire. A total of 3,191 surveys were emailed, with 1,674 sent to CNP directors in states that use NOI and 1,517 to CNP directors in states that
did not use NOI. A total of 323 surveys were returned with inadequate email addresses, and those were subtracted from the total, resulting in a study sample of 2,868.

A letter explaining the study, and that contained an imbedded internet address to link to the commodity survey was emailed to the state director or commodity director in each state included in the study. These directors were informed that they were provided with the survey for information purposes and asked not to respond.

**Research Design**

Qualitative and quantitative research methods were used to gain information on the use of commodity foods. A focus group was conducted to learn about challenges CNP directors face with cost and use of commodity foods and to provide information to aid in development of the questionnaire. A questionnaire was developed, pilot tested, and emailed to CNP directors to determine commodity use and processing systems used.

**Questionnaire Development**

A literature review and focus group were conducted prior to developing the questionnaire to ensure that important aspects of commodity program costs were included. Calls were made to USDA’s commodity distribution staff as a professional courtesy and to inform them of the survey. In addition, questions were asked to gain insight on program history, key milestones involved in commodity distribution programs, recent program changes, largest volume commodity states, and states using NOI. Commodity staff was sent a copy of the questionnaire for informational purposes.

**Focus Group.** A focus group was conducted at the SNA Child Nutrition Industry Conference (CNIC) in January 2006. The group was asked to identify value pass through systems used, and strengths and challenges of commodity processing and using commodity
foods. A convenience sample comprised of 8 school foodservice directors was invited to participate in the focus group. Participants represented both large and small school districts from a geographic cross section of the country, and NOI and non-NOI states.

Description and note-based analysis as explained by Krueger (1998) were used to analyze focus group results. Field notes were axial coded and used to determine common themes to develop the questionnaire utilized in the study.

**Written Questionnaire.** A questionnaire was developed for CNP directors based on the review of literature and results of focus group, addressing the use of commodity foods and value pass through systems used to process chicken and potato commodities. Part 1 included multiple choice and open-ended questions to determine if commodity entitlement dollars or food inventory remained at the end of school year 2005-06 and asked CNP directors to indicate why entitlement dollars or food inventory remained. Participants were asked what percent of their chicken and potato allocations were diverted to manufacturers for further processing, which VPT system was used for chicken and potatoes, and which VPT system they preferred to use. Questions were asked to determine their attitudes toward benefits of further processing. A 6-point scale (1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree) was used; a neutral response was eliminated.

Part 2 of the survey used multiple choice and open-ended questions to determine demographics of CNP director and school districts such as state, school district size, average daily participation, foodservice budget, and commodity Planned Assistance Level (PAL). Multiple choice and open-ended questions were used to determine information about survey respondents including length of time in their position, education, use of ECOS for ordering
commodities, and amount of time spent with commodity ordering, processing, and tracking. Respondents were asked questions to determine the type of food production and facilities in the district and if the school district used a buying cooperative, management company, or group purchasing organization. The questionnaire concluded with an open-ended question seeking additional comments on commodity foods and NOI.

To ensure clarity of survey questions and that key issues regarding commodity use and value pass through systems were identified and included, the first draft of the survey was emailed to a state commodity director and CNP director from a state not in the study sample. Slight revisions were made in terminology. A pilot test was conducted with 26 CNP stakeholders who were given two weeks to complete the pilot test and provide suggestions on the questionnaire. The pilot test group consisted of the 8 focus group participants and 18 PhD students who are or have been CNP directors and are part of Iowa State University’s Child Nutrition Program Leadership Academy. This pilot test group represented CNP directors from states using NOI and not using NOI. Revisions were made to the survey based on comments from the pilot test. Iowa State University Office of Research Assurance and Institutional Review Board approved the research study protocols and questionnaires prior to data collection.

**Data Collection**

Survey data were collected from CNP directors via the questionnaire administered utilizing Survey Monkey, an Internet survey tool (Survey Monkey.com LLC, Portland, OR, 2006). As Dillman (2000) recommended, a letter that explained the purpose of the research, importance of participation, participant anonymity, date the survey would close, and an internet address that was embedded in the letter (direct connection to the internet survey) was
emailed to the study sample. Instructions were included in the letter that explained how to access the on-line survey. Letters were emailed on Tuesday of the first week of August to reach CNP directors before the beginning of the school year.

Dillman’s recommendations were followed to enhance response rate. Surveys were emailed with participant name placed as a blind carbon copy (bcc) so study participants would see only their name on the email to make it appear that the message was sent to the individual rather than a mass email list (Dillman, 2000). The email letter was sent through the bulk email service at Iowa State University. Participants were given three weeks to complete the survey. As Dillman recommended, two additional contacts were made to remind participants to complete the survey (Dillman, 2000). Each week the follow-up reminder message included purpose, explanation of the importance of the research and participant anonymity, instructions on how to complete the survey, and an internet address to directly access the survey.

Data Analyses

Statistical analyses were conducted using SPSS for Windows (SPSS Incorporated, Version 13.0, Chicago, IL, 2004) and SAS (SAS Institute, Version 9.1, Cary, NC, 2003). Means, standard deviations, and frequencies were computed for variables as needed. NOI and non-NOI group means were compared using \( t \)-tests. Statistical analysis of confidence intervals, one-tailed Fisher’s exact test, and Chi-square were used to determine significance of association between variables. Statistical significance at \( p \leq .05 \) was used for all tests.

Results and Discussion

A total of 693 (24%) responded to the electronic survey. By state, Florida had the largest response rate, 32% (Table 5.1). Most Florida school districts were in session the first
week the survey was emailed, which may account for the higher response rate. On the other hand, many CNP directors are 9-month employees and may not have accessed email until mid August when some states in the study may have begun school.

The majority of respondents (70%) were from school districts with 4,999 or fewer students and (80%) reported Average Daily Participation (ADP) rates of 4,999 students or fewer (Table 5.2). The PAL dollar value reported by most CNP directors (54%) was $49,999 or less.

A majority of CNP directors (69%) reported full production facilities in each school. A central district freezer owned by the school district was reported by 50% ($n = 280$) of respondents to this question. This indicates school districts store and transport food throughout the district, which is an example of a non-value cost. NOI was developed to decrease non-value costs such as storage. A CNP director in a NOI state reported, “Reprocessing is the best way to use commodities. Our warehouse is almost empty, the inventory turnover rate is higher than previous years, and we need less people to deliver commodities.” Nearly 43% of respondents were involved in group purchasing. Five CNP directors’ responses to open-ended comments indicated commodity cooperative group purchasing helped smaller school districts meet minimum processing requirements for bulk commodity further processing.

Questionnaire instructions indicated the survey was to be completed by the person responsible for ordering and managing the school districts’ commodity program. Of the survey respondents, 72% ($n = 425$) were foodservice directors (Table 5.3). A bachelor’s or graduate degree was held by 46% ($n = 271$) of the CNP directors. Study participants were asked if they were credentialed as School Nutrition Association (SNA) School Foodservice
and Nutrition Specialists (SFNS). Eighty percent of respondents \((n = 458)\) were not
credentialled as School Nutrition Association School Foodservice and Nutrition Specialists
(SFNS). A \(t\)-test was used to compare years of service and SFNS credentialing. Results
suggest SFNS credentialled CNP directors reported a significantly longer average time of
service \((p \leq 0.05)\). SFNS credentialing provides education and training for CNP directors to
ensure they know and understand operational efficiencies and management of the school
foodservice business as well as nutrition and meal planning. This research indicates a need
for SNA to market the credential to school administrators to encourage them to hire
credentialled foodservice directors.

CNP directors reported chicken commodities were diverted to manufacturers for
further processing at a higher rate than were potato commodities (Table 5.4). Slightly more
than half \((58\%)\) of CNP directors reported that 75% or more of their chicken commodities
were diverted to manufacturers; this practice was more prevalent in NOI states \((62\%)\)
compared to non-NOI states \((51\%)\). A respondent to the survey reported, “with commodity
processing we are able to get more products for the commodity dollar value.”

Overall CNP directors reported fewer potato commodities were diverted to
manufacturers, with 56\% \((n = 286)\) diverting less than 25\% of their potato commodities to
manufacturers and only 33\% diverting 75\% or more. A majority of CNP directors \((70\%)\) in
non-NOI compared to 47\% in NOI states reported they diverted less than 25\% of their potato
commodities to manufacturers. Comments from CNP directors indicated commodity
entitlement dollars often were used for meal items that generally cost more, such as chicken
and beef. When meat entrée food needs were met, entitlement dollars were allocated toward
side items such as vegetables, fruit, and grain foods. This practice may explain the difference
between percent of chicken diverted compared to potatoes. In addition, several potato manufacturers only provide the NOI option for diverting commodity potatoes.

VPT systems are designed to monitor and track commodity value from USDA, through state processing, to the CNP director. NOI was the most commonly used VPT system reported by CNP directors for processing chicken (54%) and potato (53%) commodities. Rebate was the least reported VPT system used, reported by only 7% \((n = 38)\) of all CNP directors for chicken and by only 2% \((n = 12)\) of CNP directors reported they used rebate as a VPT for potatoes.

CNP directors were asked which VPT system would be the best to use even if not available in their state; 72% \((n = 433)\) indicated NOI, followed by fee for service (FFS) 22% \((n = 130)\), and rebate 8% \((n = 53)\). In responses to open-ended questions, CNP directors expressed support for NOI, requested more products be available through NOI, and wanted more distributors to make NOI available. Selected quotes include, “I would like more items included in NOI such as beef.” “I would like to see the distributors carry a larger variety of NOI products.” “I can control the quality with NOI, each time I serve the product it now looks and tastes the same.” “With NOI there is flexibility when ordering along with dependability.”

CNP directors’ comments indicate that CNP staff as well as state distributing agencies do not completely understand commodity diversion and may only process with outdated methods, and may be reluctant to try new methods due to lack of understanding. Respondent’s comments included, “I would like to process but I don’t completely understand it; it would cost too much.” “I have utilized NOI for seven years; foodservice managers ask
me to help them divert their commodities.” “Everyone assumes we know as much about these programs as they do. Further study is needed to understand NOI.”

When asked to share any other thoughts about commodity processing or NOI, 14 of the 56 open-ended comments (25%) received from CNP directors in non-NOI states indicated they would like to use NOI but it was not available in their state. Open-ended comments from CNP directors in non-NOI states indicated there is a desire to have NOI in their state. Comments included “It seems our state does not think NOI would work. We don’t understand why.” “My buying co-op has met considerable resistance from the state to NOI.” “My experience tells me that there is an issue in this state to using NOI or just a basic resistance to change.”

ECOS was developed and implemented by USDA in 2004 to streamline state processing commodity ordering. Decisions to allow use of NOI and ECOS are determined by the state agency. CNP directors in 25 states have access to ECOS to view commodity activity, and nine states allow CNP directors to order commodities through ECOS. In this study 76% (n = 257) of CNP directors reported they used ECOS when it was available in their state (Table 5.5). This is an encouraging finding, as USDA develops efficient and cost effective commodity processing systems that remove non-value costs from the commodity program. Even more encouraging is the finding that there was no significant difference between ECOS use in NOI and non-NOI states based on a Chi-square test of independence. This may indicate that state agencies may not be completely resistant to change; some best practices may be implemented while others are not adopted. Greater efficiency for the entire program is gained when more states use NOI and ECOS.
Table 5.5 shows that 71% \( (n = 252) \) of CNP directors in NOI states reported they used all their commodity entitlement dollars whereas only 64% \( (n = 432) \) of CNP directors in non-NOI states reported they using the commodity entitlement dollars allocated to them in SY 2005-06. This leaves over one-third of all CNP directors with unused commodity entitlement dollars. A one-tailed Fisher’s exact test indicated CNP directors in NOI states reported leftover entitlement dollars less frequently than directors in non-NOI states \( (p \leq 0.0001) \).

An examination of commodity food inventory found that 75% \( (n = 507) \) of all CNP directors reported commodity food inventory at the end of SY 2005-06. A one-tailed Fisher’s exact test revealed that fewer CNP directors in NOI states reported left over commodity food inventory left at the end of the year than did directors in non-NOI states \( (p \leq 0.03) \).

Commodity food inventory left at the end of the year in both NOI and non-NOI states, represents unused commodity food that could have decreased the amount of food purchased commercially by CNP. This remaining commodity also requires storage over the summer months; food storage costs were reported most often to be paid by CNP budgets. Added storage time may also decrease product quality and negatively affect student satisfaction of the meal program. A CNP director reported, “NOI is one way to obtain a quality product at a time our schools can use the product without having to store it”. Five CNP directors reported in open-ended comments frequent deliveries lead to a perception of fresher food that is more appealing to serve to students and had food safety benefits.

Survey results indicated end-of-year delivery was the reason for unused commodity inventory by 60% \( (n = 241) \) of CNP directors in the 8 states participating in the study. Non-NOI states reported a significantly higher rate (70%) of unused commodity food inventory
compared to CNP directors in NOI states (53%). CNP directors often cannot control when all commodities arrive, unless NOI featuring just-in-time delivery is used. In 2003, USDA approved poultry substitution that allows manufacturers to offer CNP directors commodity products from commercial inventory as long as the food is of the same generic identity, equal or better quality, and meets USDA standards for CNP (USDA, 2003). This process allows CNP to receive commodity food inventory at the beginning of the school year before USDA may procure raw materials. Substitution for beef and pork are pending approval in the proposed federal rule that appeared in the Federal Register August 24, 2006 (USDA, 2006b).

CNP director comments included, “I am tired of using my storage space for extended storage of USDA commodities.” Another reported, “Left over end-of-year food is usually the food I needed in the first nine months of the year.” CNP director’s dissatisfaction with commodity distribution demonstrates the need for better inventory management and purchasing by USDA. Another solution to inventory management may be the approval of substitution for all commodity foods; this would allow use of commodity food inventories and entitlement dollars at the beginning of the school year. Manufacturers would have to assume the risk of selling products with commodity discounts while waiting for USDA to purchase the commodity from the market.

With NOI, manufacturers and distributors assume the cost of storage. This saves storage and administrative costs for child nutrition programs. As noted in CNP director comments from NOI states, “With NOI, you know exactly when you are getting the product and what it tastes like.” Several CNP directors stated that freezer space was limited and NOI with order as needed capabilities saved storage space and cost. “NOI cuts down on inventory and holding time and expense. Using foods in a timelier manner preserves food quality as
well as nutrition integrity.” Another CNP director wrote, “Being able to order as needed cuts down on waste and there is less product left in inventory.”

Several survey respondents reported wanting cash in lieu of commodities as an option in their state, stating the cash would be used to purchase more fresh fruits and vegetables. Other CNP directors indicated cash to purchase all their foods would be better than receiving commodity food allocations. Cash in lieu of commodities is a perennial request by CNP directors related to the commodity program. This approach would defeat the intended purpose of the commodity program, which is to remove excess agriculture surplus from the market. For maximum efficiency, the systems should be tested and approved on a national basis to ensure cost savings for all parts of the commodity distribution system rather than approved state by state.

The majority of CNP directors (70%) in all states strongly agreed or agreed that further processing allows them to serve USDA commodities in a form that students like (Table 5.6). A CNP director confirmed the study results, “students like the processed commodities much more than what we were making.” Another CNP director pointed out the flexibility of NOI to accommodate student taste preference, “with NOI, if a product is not successful with our students we can usually change to another product with that company.”

In some states, the state agency controls the commodity food selection and manages the agreement with a manufacturer to process a limited variety of products to be delivered to a state warehouse and distributed to all school districts in the state. Other state agencies allow CNP directors to determine what products are needed from their commodity entitlements. Individual state distribution systems may affect CNP director responses.
Fifty-five percent of CNP directors \((n = 379)\) strongly agreed or agreed that using NOI that allows just-in-time delivery that makes it easier for them to plan menus using commodity foods compared to other VPT systems. “Using foods in a timelier manner (compared to long-term storage) preserves food quality as well as nutrition integrity” and “NOI truly enhanced our efficiency and menu variety,” reported CNP directors in the study. Also, 52\% \((n = 431)\) strongly agreed or agreed that there is a monetary benefit in the added cost of diverting bulk chicken and potato commodities to manufacturers for further processing. CNP directors supported the convenience and labor savings as well as decreased food safety concerns that resulted from using NOI.

**Conclusions and Applications**

The results of this study on the use of commodity foods and NOI indicated there are unused commodity entitlement dollars and food inventory left at the end of the school year, mainly due to end-of-year deliveries. There is a perception among CNP directors that NOI is a VPT system that is desired in states not currently using NOI and is preferred in states currently using NOI. Diverting commodities to manufacturers for further processing is perceived by CNP directors in all states in the study, as a system that improves CNP directors’ ability to use and to serve commodities in forms students like. The study indicated CNP directors perceived diverted further processed commodities as labor saving and provided a food safety benefit for CNP directors.

Results of this research indicate that education is needed for CNP directors to ensure commodity entitlement dollars are viewed as monetary assets in the CNP operation and that they understand the commodity system. As more efficient, economical commodity systems are developed the cost savings can be transferred into other areas of CNP. CNP directors
must consider the cost savings that VPT systems offer not only to the foodservice department, but also to areas of the school district, state distributing agency, USDA, and manufacturers.

Increased communication between USDA and CNP directors also is needed to inform CNP directors of new systems and regulations affecting the commodity program. CNP directors should take advantage of resources located on USDA’s Food Distribution Programs website to keep current on processing improvements. Increased participation of CNP directors in American Commodities Distribution Association (ACDA) as association leaders would provide CNP directors’ point of view related to commodity processing.

In addition to education and increased communication, research is needed to examine the cost of commodity processing systems. Such research can lead to the development of new and cost effective commodity processing systems or modifications of existing systems to increase efficiency. USDA should continue working with all constituents in the commodity distribution process to develop new systems that remove non-value costs, increase nutrition content, and create an efficient, convenient, and easy-to-use commodity system that benefits all stakeholders of the commodity program.

The Child Nutrition Foundation should consider developing a commodity-specific training program to be offered through SNA’s on-line Child Nutrition University to educate CNP directors on cost effective use of commodities and processing systems available. To reinforce commodity education, the SFNS credentialing exam should include questions on commodity management and processing systems. Demonstration project results and testimonials of effective commodity management best practices could be featured in a monthly commodity column in the *School Foodservice and Nutrition* magazine. This may be
another effective method to teach other CNP directors how to wisely manage commodities. Commodity specific networking opportunities and education sessions for CNP directors to share best practices during state and national meetings would be an effective method for CNP directors and state commodity directors to learn about operational cost saving strategies from colleagues.

Further research is needed to determine why commodity entitlement dollars and food inventory is left unused at the end of the school year. Additional research is needed to determine which foods, are unused, the cost of unused commodity entitlement, the cost of storage, and deterioration of commodities left at the end of the school year. Additional research is needed to identify why schools are not using all allocated entitlement dollars available to them. Unused commodity entitlement dollars or food inventory left at the end of the school year becomes a liability when CNP directors pay for storage over summer months and is equivalent to leaving money on the table that could have decreased the cost of managing the foodservice program.

There is a need to continue to strengthen the commodity education track offered at SNA’s ANC as this is provides a valuable training opportunity for SNA to enhance business skills of CNP directors. Money that the school CNP program can save by efficacious use of commodity foods can be used for other commercial food purchases, equipment upgrades, or purchase of higher quality or brand name items that students recognize, which can improve program reputation and increase ADP.

The commodity program has made many changes in the past five years to improve use and convenience of commodity foods for CNP. It appears that improvements will
continue on the federal level. CNP directors and state agencies must keep pace with cost
saving options available to create an effective commodity program.

References


Table 5.1. States Participating in Study

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<sup>a</sup>Total after 323 returned email letters were subtracted from original number sent (3,191)
Table 5.2. Characteristics of School Districts (N = 693)

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Table 5.2 (continued)

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<td>Central district freezer owned by school district</td>
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<td>One or more central kitchens that transport meals to satellite kitchens</td>
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<td>Full production kitchens in each school</td>
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<td>School receives meals in bulk from production kitchen</td>
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<td>School receives pre-plated meals from production kitchen</td>
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<tr>
<td>Majority of menu items prepared from scratch</td>
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<td>Majority of menu items are heat and serve products</td>
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<td>34</td>
<td>136</td>
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<td>Equal mix of menu items prepared from scratch and heat and serve products</td>
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<td>57</td>
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Table 5.3. Characteristics of Survey Participants

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<td>n</td>
<td>%</td>
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*School Foodservice and Nutrition Specialist credentialing by School Nutrition Association*
Table 5.4. Value Pass Through System Used and Percent Commodity Diverted to Manufacturers for Further Processing by CNP Directors for Chicken and Potatoes ($N = 693$)

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<sup>a</sup>Percent may exceed 100 due to rounding
Table 5.5. Method Used to Order Commodities and Commodity Use in SY 2005-06 (N = 693)

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<th></th>
<th>Total States</th>
<th>NOI States</th>
<th>Non–NOI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>n</td>
<td>n</td>
</tr>
<tr>
<td>ECOS option available in the state</td>
<td>301</td>
<td>52</td>
<td>161</td>
</tr>
<tr>
<td>Used ECOS to order commodities</td>
<td>257</td>
<td>76</td>
<td>134</td>
</tr>
<tr>
<td>Used all commodity entitlement dollars</td>
<td>432</td>
<td>64</td>
<td>252</td>
</tr>
<tr>
<td>Had unused commodity food inventory at end-of-year</td>
<td>507</td>
<td>75</td>
<td>261</td>
</tr>
</tbody>
</table>
Table 5.6. CNP Directors’ Perceptions of Cost and Convenience of Diverting Bulk Commodities for Further Processing (N = 588)

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean ± SD</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Non-NOI</td>
<td>NOI</td>
<td>Non-NOI</td>
<td>NOI</td>
<td>Non-NOI</td>
<td>NOI</td>
</tr>
<tr>
<td>Diverting commodities offers forms students like</td>
<td>5.1 ± 1.1</td>
<td>9 (1%)</td>
<td>7 (2%)</td>
<td>2 (1%)</td>
<td>20 (3%)</td>
<td>12 (4%)</td>
<td>7 (3%)</td>
</tr>
<tr>
<td>Further processing makes commodities easier to use</td>
<td>5.0 ± 1.1</td>
<td>9 (1%)</td>
<td>9 (3%)</td>
<td>0 (0%)</td>
<td>21 (3%)</td>
<td>12 (4%)</td>
<td>9 (2%)</td>
</tr>
<tr>
<td>Further processed commodities reduce labor costs</td>
<td>4.8 ± 1.2</td>
<td>13 (2%)</td>
<td>11 (3%)</td>
<td>2 (1%)</td>
<td>31 (5%)</td>
<td>19 (6%)</td>
<td>10 (3%)</td>
</tr>
<tr>
<td>There is a monetary benefit to divert chicken and potato commodities</td>
<td>4.6 ± 1.3</td>
<td>21 (3%)</td>
<td>16 (5%)</td>
<td>3 (1%)</td>
<td>33 (5%)</td>
<td>18 (5%)</td>
<td>12 (3%)</td>
</tr>
<tr>
<td>NOI makes it easier to plan menus using commodities</td>
<td>5.3 ± 1.2</td>
<td>4 (1%)</td>
<td>1 (0%)</td>
<td>2 (1%)</td>
<td>15 (2%)</td>
<td>8 (2%)</td>
<td>6 (3%)</td>
</tr>
<tr>
<td>Some commodities cost more than commercial foods</td>
<td>3.9 ± 1.4</td>
<td>30 (4%)</td>
<td>16 (5%)</td>
<td>12 (5%)</td>
<td>88 (13%)</td>
<td>48 (14%)</td>
<td>35 (16%)</td>
</tr>
<tr>
<td>Further processing costs for chicken and potatoes prevents me from using this option</td>
<td>2.9 ± 1.5</td>
<td>91 (13%)</td>
<td>54 (16%)</td>
<td>34 (16%)</td>
<td>237 (34%)</td>
<td>141 (41%)</td>
<td>84 (39%)</td>
</tr>
</tbody>
</table>

*Note.* Responses were made on a 6–point scale (1 = strongly disagree, 6 = strongly agree)
CHAPTER 6: RESEARCH MANUSCRIPT II: COSTS AND VALUE OF COMMODITY FOODS IN STATES THAT USE AND STATES THAT DO NOT USE NET OFF INVOICE AS A VALUE PASS THROUGH SYSTEM

A manuscript prepared for submission to *The Journal of Child Nutrition & Management*

Barbara Jirka and Jeannie Sneed

**Introduction**

The United States Department of Agriculture’s (USDA) commodity distribution program was designed to serve a dual purpose: to support American agriculture and provide nutritious food for schoolchildren (USDA, 2000; 2006b). During school year (SY) 2005, USDA purchased over 1.1 billion pounds of food commodities for Child Nutrition Programs (CNP) valued at over $800 million (USDA, 2006b). The commodity program is funded primarily through Section 32 entitlement funds enacted through Public Law 320 in 1936. To qualify for funding, meals served must meet federal requirements and free or reduced-price lunches must be offered to eligible children (USDA, n.d.a). In SY 2005-06, school food authorities received $0.175 in commodity food value for each qualifying lunch served (USDA, 2005b). In addition, schools received cash reimbursement of $2.49 for each free lunch, $2.09 for each reduced-price lunch, and $.30 for each full-price lunch served (USDA, 2005a).

According to the School Nutrition Association (SNA) (2006b), primary and secondary school foodservice operators purchased $7.2 billion of food, which was approximately 15% of the $47.1 billion non-commercial foodservice market. SNA (2006b) estimated USDA commodity foods account for 20% of the food dollars used by Child Nutrition Programs (CNP).
Commodity program regulations are established by USDA between manufacturers, state agencies, and CNP directors. Substitution and standard yield are examples of USDA regulations established to ensure equal or more commodity product is returned to CNP (USDA, 2006a). Substitution requires manufacturers to add raw commercial ingredients at their expense to produce a standard yield for each end product. High standard yields are set on foods with high manufacturing losses such as poultry and potatoes (USDA, 2006a).

Net off invoice (NOI) is allowed when used with substitution and standard yield. NOI allows manufacturers to credit CNP directors with commodity food credit on commercial purchases through their regular distributor at time of purchase on a case-by-case basis. CNP directors no longer are required to accept the entire truckload of end products (for example 36,000 pound of poultry), but allows CNP directors to purchase in quantities as needed.

The State Processing Program is the division of the commodity program that manages state level contracts and allows eligible recipient agencies to contract with commercial food manufacturers to convert bulk or raw USDA commodities into convenient ready-to-use end products (USDA, n.d.b). The State Distribution Agency manages the State Processing Program and may manage a state commodity warehouse system to distribute commodities.

**Cost of Using Commodity Foods**

According to USDA’s *Food Distribution 2000* (USDA, 2000), commodity funds should be used efficiently to maximize food purchasing power and minimize non-value activities. Each dollar that goes for unnecessary storage, plate waste, and other non-value costs is a dollar wasted (USDA, 2000). Efficacious use of commodities allows CNP directors to use revenue to purchase equipment, update serving areas, and purchase higher-quality and brand name foods (USDA, 2000). Higher participation and decreased plate waste by students
when offered brand-name items leads to increased school lunch participation and a la carte sales (U.S. GAO, 1996).

Managing food costs to ensure quality and optimize financial performance is a challenge for many school foodservice directors (Hwang & Sneed, 2004). USDA’s Economic Research Service (ERS) suggests that improving the selection of commodity foods may be a strategy to decrease plate waste in CNP (Guthrie & Buzby, 2002). The ERS study noted USDA’s effort to improve the nutritional profile and acceptability of commodity foods (Guthrie & Buzby, 2002).

Labor and food purchases are the primary expenses for CNP in six states that participated in a GAO study that showed CNP directors reported decreasing labor costs by serving more pre-packaged foods with less preparation, reducing staff numbers, and replacing full-time staff with part-time staff (U.S. GAO, 2003). The U.S. GAO study (2003) reported there was an increase in the cost of labor and at the same time, there was a decrease in the supply of skilled workers for school foodservice positions. In addition, school boards placed emphasis on finances and expected CNP to run like a business with break-even or better financial records (USDA, 2000). The GAO study reported CNP directors planned menus around USDA commodities to reduce food costs (U.S. GAO, 2003).

USDA’s Commodity Improvement Council (CIC) discovered CNP directors changed procurement practices based on alternative food choices available from manufacturers at reasonable prices (USDA, 2000). CNP directors no longer depended on commodities, such as uncooked, frozen chicken and hamburger, that required additional preparation and labor when students preferred chicken nuggets and pizza. The total cost of using commodity foods became more expensive than similar commercially available products (USDA, 2000).
Elimination of non-value-added costs could allow greater use of program dollars directed toward commodity food purchases in forms desired by students and delivered through commercial channels. The concept of just-in-time delivery may offer to CNP directors the benefit of enhanced product quality. There is a need to identify and reduce non-value-added costs at all levels of commodity distribution. VPT options make diverting commodity foods easier, providing CNP directors a wider variety of reduced-fat, reduced-sodium, and whole grain commercially processed food options.

USDA’s Business Process Reengineering (BPR) and Food Distribution 2000 report revamped the commodity program and created dramatic changes (USDA, 2000). Approval of substitution of equal or better product and net off invoice (NOI), a hybrid sales discount system, are two changes that removed non-value costs in CNP. These changes allow just-in-time delivery from commercial distributors to eliminate some storage and delivery costs and allowed CNP directors to purchase commercial products and receive commodity credit (USDA, 2000). Currently, 21 states have implemented NOI (K12 Services, Incorporated, Rockville, MD, 2006).

Electronic Commodity Ordering System (ECOS) was another program that resulted from USDA’s BPR and Food Distribution 2000. ECOS allows CNP directors to place and monitor commodity orders electronically. Currently nine states allow CNP directors to order commodities using ECOS and in 25 states CNP directors have access to ECOS to monitor commodity orders.

Not all CNP directors have access to the systems developed by USDA. State commodity directors determine the VPT systems and commodity ordering procedures used in their state (USDA, 2006a). State agencies determine commodity regulations within the state
and are not required by USDA to use VPT systems and determine CNP directors’ level of access to ECOS. There are proposed procurement regulations that will affect all school district purchases. State agencies and school districts will be required to comply with these proposed procurement regulations that may affect how schools purchase food and supplies, including timing of school bids and commodity diversions (USDA, 2006d).

**Nutrition and Commodity Foods**

The Institutes of Medicine (IOM) found childhood obesity rates tripled in the past 30 years and continue to increase (IOM, 2005). Currently, nine million children age 6-11 years are obese (IOM, 2005). Story, Kaphingst, and French (2006) claim that schools can play an important part in a national effort to prevent childhood obesity. These researchers report more than 95% of American youth age 5 - 17 are enrolled in school, and no other institution has as much continuous and intensive contact with children during their first two decades of life (Story, Kaphingst, & French, 2006).

The rising number of overweight or obese children led researchers to question the role of CNP in contribution and prevention of obesity (American Dietetic Association [ADA], 1996; Stitzel, 2004). These claims led USDA to review published studies that connect school meal programs to childhood overweight and obesity. An inconsistent relationship between socioeconomic status and obesity in children has been reported (Linz, Lee, & Bell, 2005). On the other hand, participation in a food assistance program affected the diet in two ways: increased the quality of food consumed and led to intake of foods with higher nutritional value (Levendahl & Oliveira, 1999).

School environments and student tastes have changed in past decades; popularity of heat-and-serve foods and availability of processed items have increased. A la carte and
vending were reported as widely used as alternatives to serve students and increase revenue (GAO, 2003). According to Centers for Disease Control and Prevention’s (CDC) School Health Policies and Programs Study (SHPPS), 43% of elementary and 98% of high schools offered food and beverages in vending, school stores, canteens, or snack bars (CDC, 2000).

A decline in commodity use has been attributed to changes in the school environment during the 1990s (USDA, 2000). Gregoire and Sneed (1993) found no consensus among CNP directors regarding the role of commodities in supporting Dietary Guidelines for Americans (DGA). In SY 1996-97, USDA began the School Meals Initiative (SMI) that resulted in stringent nutritional requirements for school meals (USDA, 2001). A subsequent U.S. GAO report (2003) stated school lunches must meet the DGA.

**Nutrient content of commodities and commercial foods.** Nutrient content of both commodity chicken nuggets and crinkle cut French fries are similar to manufacturer products offered to CNP directors with commodity further processing. A USDA chicken nugget portion that provides 2 meat/meat alternate servings contained 250 calories, 17 g protein, 13 g fat, 3.5 g saturated and *trans* fat, and 650 mg sodium. The range of comparable commercial products for the same serving size was similar in nutrient content. Commercial chicken nugget products averaged 270 calories, contained 14 g protein, 17 g fat, 4 g saturated and *trans* fat, and 500 mg sodium.

USDA’s crinkle cut French fries contained 150 calories for a half-cup serving with 5 g fat, 2 g fiber, and 40 mg sodium. Commercial manufactured products identified by CNP directors contained on average 160 calories, 7 g fat, 2 g fiber, and 330 mg sodium.

The purpose of this study was to examine CNP directors’ perceptions of costs and nutrient content of commodity foods in selected states that use NOI and states that do not use
NOI. Additional research questions explored time spent with commodity management, relationship of size of CNP and time spent managing commodities, use of ECOS, and responsibility for commodity costs. CNP directors’ perceptions of food safety also were examined.

Methods

Study Sample

The study sample was comprised of CNP directors from 8 states. One group of 4 states (Florida, Illinois, Pennsylvania, and Texas) used net off invoice (NOI) as a value pass through (VPT) system for poultry and potatoes, and one group of 4 states (Georgia, Massachusetts, Missouri, and Washington) did not use NOI as a VPT system for these same foods as of July 2006. States were purposively selected based on largest commodity volume, as provided by USDA Food and Nutrition Service, availability of electronic mailing lists, and number of CNP directors needed to obtain a similar sample size for both NOI and non-NOI groups.

Calls were made to USDA’s commodity distribution staff as a professional courtesy, and to gain insight on commodity history, changes, and largest volume commodity states, and to generate support for the research. Commodity staff was sent a copy of the questionnaire for informational purposes. A letter explaining the study and containing an Internet address to link to the commodity survey was emailed to the state director or commodity director in the states included in the study. Directors were told that they were provided with the survey for information purposes and asked not to complete the survey.

Email address lists were obtained from the state CNP director, commodity director, or state School Nutrition Association affiliate. All CNP directors in the 8 states were sent
electronic surveys. A total of 3,191 surveys were emailed, with 1,674 sent to CNP directors in states that used NOI and 1,517 to CNP directors in states that did not use NOI. A total of 323 surveys were returned with inadequate email addresses, resulting in a total study sample of 2,868.

**Research Design**

Qualitative and quantitative research techniques were used to determine CNP directors’ perception of cost and nutrient content of commodity foods. A focus group was conducted with CNP directors to identify challenges and costs of using commodity foods in CNP. Based on the focus group results and a literature review, a questionnaire was developed, pilot tested, and sent to CNP directors.

**Questionnaire Development**

**Focus group.** A focus group was conducted at the SNA Child Nutrition Industry Conference (CNIC) in January 2006 to identify challenges and costs associated with using commodity foods to assist in development of the survey questionnaire. A convenience sample of 8 school foodservice directors were invited to participate. Large and small school districts from a geographic cross section of the country were represented.

Description and note-based analysis (Krueger, 1998) were used to analyze focus group results. Field notes were axial coded and used to determine common themes that were used to develop the questionnaire utilized in the study (Krueger, 1998).

**Research questionnaire.** A questionnaire was developed to determine costs of using commodity foods and CNP directors’ perceptions of nutrient content of commodities. Chicken and potatoes were used to obtain specific information for some questions due to the variety of systems used with commodity foods. These items were selected based on large
volume used and high manufacturing losses and standard yield associated with these products. Part one of the questionnaire used multiple choice and open-ended questions to determine estimates of storage, delivery, administrative, personnel, and unused food costs associated with commodities. In addition, questions about perceptions of nutrient content of bulk and diverted commodities were asked. A question to determine perceptions of food safety of commodity foods also was included.

Part two of the survey used multiple choice and open-ended questions to determine demographic information such as state, school district size, average daily participation (ADP), and commodity Planned Assistance Level (PAL). Other questions determined information about the survey respondent including length of time in their position, School Food and Nutrition Specialist (SFNS) credentialing, use of ECOS, and estimated amount of time spent managing commodities. The questionnaire concluded with an open-ended question on costs of using commodity foods and NOI.

**Pilot test.** To ensure clarity and completeness of the survey, the first questionnaire draft was emailed to a state commodity director and CNP director from a state not included in the study sample. Slight revisions were made in terminology. A pilot test was conducted with 26 CNP stakeholders. The pilot test group consisted of the 8 focus group participants from the January CNIC commodity focus group and 18 PhD students enrolled in a Child Nutrition Program Leadership Academy. This pilot test group represented CNP directors from states using NOI and not using NOI. Revisions were made based on comments from pilot test participants. Iowa State University Office of Research Assurance and Institutional Review Board approved the research study protocol and questionnaire prior to data collection.
Data Collection

Data were collected from CNP directors using an on-line questionnaire administered by Survey Monkey, an Internet software survey tool (Survey Monkey.com LLC, Portland, OR, 2006). A letter that explained the purpose of the research, importance of participation, explanation of participant anonymity, and an internet address (direct link to the on-line survey) was emailed to the study sample (Dillman, 2000). Instructions were included in the letter that explained how to access the on-line survey. Letters were emailed on Tuesday of the first week of August to reach CNP directors before the beginning of the school year.

CNP directors were given three weeks to complete the survey. As recommended by Dillman, two additional contacts were made at the beginning of each of the second and third weeks of the study to remind participants to complete the survey (Dillman, 2000). The follow-up email letter explained the purpose of the survey, importance of participation, anonymity of participants, and included a direct connection to the internet survey and instructions on how to complete the survey as Dillman recommended. To enhance response rate, surveys were emailed with each participant’s name placed as a blind carbon copy (bcc) so study participants would see only their name on the email to make it appear that the message was sent to the individual rather than a mass email list (Dillman, 2000). The email letter was sent through the bulk email service at Iowa State University.

Data Analyses

Statistical analyses were conducted using SPSS for Windows (Version 13.0, 2004) and SAS (Version 9.1, 2003). Means, standard deviations, and frequencies were computed for variables as needed. Cronbach’s alpha reliability coefficient was calculated to determine reliability, $t$-tests were used to compare means between groups, and Chi-square was used to
test relationship of variables. A probability of $p \leq 0.05$ was used for all tests of statistical significance.

### Results

**Focus Group**

Results of the focus group revealed varied perceptions of commodities. Although Section 32 funds are allocated for foods used in National School Lunch Program (NSLP), none of the CNP directors considered commodities as funds that could help in balancing financial needs of providing school meals. Section 32 funds represented “free food” and “funny money” that was not really money, but food CNP directors were required to use, with no voice in what was purchased or when it was delivered. Many focus group participants stated some commodity foods cost more to use than those that could be purchased commercially.

Focus group participants shared their challenges with their state’s processing program. Most agreed the state purchasing official often did not have adequate experience in foodservice to make commodity decisions. Several participants in non-NOI states indicated closed state systems that allowed limited input from CNP directors to determine commodity foods needed or the specific food items that should be processed from bulk commodities. Lack of consistency among state programs was confusing to CNP directors. Several participants indicated a solution to their challenges was less state control. Conversely, CNP directors from other states, representing NOI states, reported good communication and cooperation with state processing agencies.

When asked about costs associated with commodity foods, the first and most agreed upon was storage related to commodity foods delivered at the end of the school year. Focus
group participants stated freezers were purchased to manage large truckload commodity deliveries, which increased administration and labor costs to manage and transport commodities within the school district. Also reported was waste of unused and recalled commodities for which delivery and storage costs had been paid and were non-recoverable.

Additionally, nutrition and waste were expressed as costs. Several CNP directors commented on lost sales from decreased ADP due to challenges in finding a commercial equivalent to commodity products. When commodities run out and commercial products are substituted, students noticed the change. Commodity products were also perceived to be higher in fat and sodium. There was agreement among focus group participants from both NOI and non-NOI states that USDA is improving nutrient content of commodity foods.

**Survey Results**

**Survey respondent demographic profile.** A majority (70%) of survey respondents were CNP directors (Table 5.2). Over 70% of respondents were from school districts with enrollment of 4,999 or fewer students, 80% had average daily participation (ADP) of 4,999 or fewer students, and 54% reported commodity Planned Assistance Levels (PAL) of $49,999 or less. Under half (43%) of CNP directors indicated they belonged to a commodity only cooperative to participate in the bulk commodity processing program. Seven participants whose districts were managed by a foodservice management company (FMC) indicated commodity purchase decisions were made by the FMC, not by on-site staff.

**Time spent managing commodities.** A majority (57%) of CNP directors reported they spent less than five hours per month to order, receive, and monitor use of commodity foods within the district. About half (52%) estimated needing one to two full-time equivalent (FTE) staff to manage commodities and 7% required 11 or more FTE to manage
commodities (Table 6.1). A negative correlation was observed between the amount of time spent managing commodities and ADP \( p = 0.05 \).

Survey results indicated time and labor savings using processed commodities were benefits mentioned more often in NOI states compared to non-NOI states. A CNP director in a non-NOI state reported in open-ended comments that time spent managing commodities can be better utilized for staff training and education. Another respondent stated NOI is the only way to go because it saved time and energy.

**Timing of commodity deliveries.** Nearly all (97%) CNP directors reporting unused commodity food inventory indicated the reason they had chicken commodity allocation left over was due to end-of-year delivery. Study respondents indicated often the commodities they received at the end of the year were items they needed nine months ago. Two CNP directors expressed a concern regarding timing of when commodity diversions were due to the state agency, which was February, and bids were sent to vendors in April. “Coordination in timing of commodity diversions and bids is needed to provide schools the opportunity to negotiate the best price from manufacturers,” stated a survey respondent.

**Delivery costs and storage.** Delivery costs were more often reported per case \( n = 493 \) than per pound \( n = 165 \) for delivery of frozen commodity foods. The most commonly reported charge per case was $2.00 - $2.99, reported by 34% of CNP directors (Table 6.2). Eleven percent of CNP directors reported not paying a delivery charge per case. The second commonly reported cost per pound was $.10 - .49, as reported by 18% of all respondents.

Survey results indicated CNP directors agreed storage was a challenge with commodities. Open-ended comments reported the ability to order commodities as needed was a benefit of NOI. One respondent indicated NOI was the best way to use commodities
and fewer staff was needed, and the district warehouse was almost empty due to higher product turnover rate.

A CNP director indicated that although her state did not allow NOI, this system would greatly reduce paperwork and time needed to manage commodities. Others commented on the flexibility NOI provided with the ability to order several different products with commodity allocations rather than using the entire allocation for one product. Of the 56 comments received from CNP directors in non-NOI states, 14 (25%) indicated they would like to use NOI but it was not available in their state.

Costs associated with unused commodity foods. Table 6.3 shows 90% \((n = 298)\) of CNP directors in NOI states and 92% \((n = 194)\) in non-NOI states reported the foodservice budget pays administrative time to manage commodities. Other costs reported by 81% of CNP directors in both NOI \((n = 263)\) and non-NOI \((n = 175)\) states paid by foodservice budgets are processing fees to manufacturers. Most all costs associated with CNP are paid by the foodservice budget and are not paid by school district budgets, including costs such as commodity foods delivered at the end of the school year, in unusable forms, and those transferred to the district late in the year and not requested.

Budget and facilities associated with commodities. Study results indicate nearly 50% of CNP directors reported the district owned a central freezer, 36% of school districts owned a central foodservice warehouse, and 40% reported school districts owned trucks and vehicles for food transportation between the central warehouse and school buildings. Six respondents commented that much of the food in storage was USDA commodities.

Control of commodity decisions such as VPT methods, variety of commodity products diverted, and forms of commodity products purchased was associated with cost
savings for CNP directors. For example, in reference to NOI one director noted, “in our business, that control equates to dollars.” NOI enhanced efficiency and menu variety as a study participant responded, “we feel we have more control, which results in fresher, more manageable quantities and food that is safe and appealing to serve our customers.” For other CNP directors, that control meant better nutrient content of commodity products.

**CNP director perceptions of nutrition and food safety of commodities.** A 6-point scale was used for questions to determine CNP directors’ perceptions of nutrition of commodity foods. The 6-point scale eliminated a neutral response. The majority of directors (76%) agreed or strongly agreed that nutrient content was important when making commodity purchase decisions (Table 6.4). Results indicate there was a significant difference between CNP directors in NOI and non-NOI states in their perceptions of the importance of nutrient content of commodity foods. CNP directors in NOI states reported nutrition was more important than cost when making food purchase decisions for CNP ($p = 0.05$). In open-ended comments, one CNP director stated, “While nutrition was important, it must be balanced with cost and product acceptability among students.”

Nutrient content of commodity foods was mentioned in 31 of the 136 (23%) open-ended responses shared by CNP directors. Five of the comments mentioned CNP directors are required to serve meals that meet nutrition guidelines yet foods provided by the regulating agency were not perceived to meet those requirements. CNP director comments included “there is a need for more grilled and lightly or non-breaded meat.”

A 6-point rating scale was used for questions to determine CNP directors’ perceptions on benefits of diverting commodity foods. Results indicated 69% percent ($n = 482$) of all CNP directors somewhat agreed, agreed, or strongly agreed, compared to only 15% ($n = 100$)
who disagreed, that diverting bulk commodities to a manufacturer for further processing provided greater control of the nutrient content of commodities. There was no difference between responses of CNP directors in NOI and non-NOI states in response to questions about nutrition and diverted commodity foods. There was a difference between groups in response to the question, nutrition is more important than cost when making a food purchase decisions for CNP, with directors in NOI states indicating a higher rate of agreement than those in non-NOI states.

CNP directors reported they had greater control of the nutrient content with NOI because it allowed them to offer a continuous level of food quality and freshness. In open-ended comments, a CNP director reported, “The greatest value of NOI is that we can purchase, at a reduced rate, the exact products most acceptable to our students along with the option of choosing certain nutrition standards.” Another CNP director reported NOI offered more variety and allows the program to adapt to the fluctuating tastes of students.

Food safety appears to be an important consideration in selecting fully cooked meats, as 63% of all CNP directors strongly agreed or agreed that further processed, fully cooked commodities reduce food safety concerns. There was not a difference between CNP directors in NOI and non-NOI states in their level of agreement with the statement that further processed foods provide greater food safety than bulk commodities. A CNP director reported in open-ended comments, “Commodity processing for meat and poultry provides consistent products that kids like; reduces chances of foodborne illness; and reduces labor costs, that is essential with staff with limited food preparation skills.”
Conclusions and Applications

Further research is needed to quantify costs of unused commodity foods, and determined reasons commodity foods or entitlement dollars are unused at the end of the school year. Total amount of entitlement dollars or unused commodity foods may be higher than USDA or CNP directors expect. Research also is needed to determine reasons for end-of-year delivery and unused commodity entitlement dollars. If the issue is end-of-year deliveries, one solution may be more programs such as substitution and standard yield implemented for more variety of bulk commodities. Making NOI available to CNP directors in more states for more products also may help reduce commodity foods left at the end of the year. An incentive for state agencies to use cost saving systems, such as NOI and ECOS, could improve the overall efficiency of commodity distribution. CNP director comments in non-NOI states indicated there is a desire to implement NOI, some CNP directors indicated there was resistance from the state agency.

The cost of unused or wasted foods due to products students do not like is an issue that requires further research. In open-ended comments on the survey, four respondents indicated the flavor difference in USDA products between deliveries due to various suppliers manufacturing each product. Diverting bulk commodities to manufacturers and using VPT systems allows CNP directors to specify the manufacturer and nutrient content of commodity foods. Costs, such as storage and labor required for preparing, delivering, and managing commodity inventory, should be factored into the price of using commodity foods.

SNA’s 2006 Indirect Costs Study (SNA, 2006a) reported that as more CNP are required to pay higher indirect costs to cover district services, directors may seek alternative food purchasing practices. Administrative staff salaries and staff involved in warehouse
management and delivery add to the cost of commodity foods and more often are reasons for the increased indirect costs paid by school foodservice departments. This is a factor to consider monitoring.

Volume of product needed the entire year should be considered when making commodity diversion decisions. Many smaller school districts participate in commodity purchase cooperatives to coordinate commodity truckloads for manufacturer diversions. This was an economical practice mentioned by many of the small school districts.

“Commodities are essential for our program to manage fiscally,” reported a CNP director who understands the need to apply business acumen to CNP. There is a need for increased business operations and financial management training for CNP directors to improve procurement and management practices. Increased pressure has been placed on CNP directors to run financially independent programs and contribute increased percentage of indirect costs to district general funds (SNA, 2006a). Best practices from manufacturing and business management systems should routinely be examined and applied to CNP. Supply chain cost reduction models are needed to decrease cost and increase efficiency of managing the CNP enterprise. Best practices in procurement management need to be collected and showcased to assist other CNP directors in improving procurement practices.

To improve business skills of CNP directors, hospitality management programs and business schools at universities should work together to develop management system models that combine nutrition and foodservice management skills. A broader knowledge of supply chain systems may increase business skills of CNP directors. This would extend the current practice of analyzing production records and meals per labor hour taking the analysis to the next broader scope of business analysis. Continued education on business practices such as
financial management and purchasing will improve CNP efficiencies and decrease program costs. In addition, at the school-district level, central business office administrative support is recommended for all CNP directors to allow adequate support for financial management and business administrative activities required to run a successful CNP.

Improved communication between CNP directors, state distributing agencies, manufacturers, distributors, and USDA is needed to identify existing barriers to using commodities in CNP and identify options to overcome them. All constituent groups must be willing to change to improve the entire system. Networking and learning best practices from peers increases awareness of business efficiencies and opens doors to new options.

Survey results confirmed the nutrient issues expressed by the focus group. Comments from CNP directors regarding perceptions of nutrient content indicated it is difficult to meet nutrition guidelines with commodity foods, diverting bulk commodities for further processing is an alternative allowing greater control of nutrient content. USDA’s initiative to improve nutrient content of commodities to meet the Dietary Guidelines will continue, according to Food Distribution Program newsletters. CNP director communication with USDA will advise commodity staff on the products most in need of nutrient modification. Nutrient content is an increasing concern for CNP directors with Wellness Policies being developed that involve the entire school, not just the foodservice department. Parents continue to take an active role in school nutrition and may force restrictive guidelines on CNP directors at the school district level through their involvement in wellness policy committees.

There is a need to educate school decision makers and parents that nutrition guidelines were designed to apply to complete meals over time. Each food item should not be
analyzed individually but as an entire meal, averaged with the entire week’s menu.

Guidelines are needed and must be realistic to meet student acceptability and maintain program participation. Small adjustments and changes should be gradual, reducing lower nutrient dense foods while increasing higher nutrient dense foods to avoid a decrease in student participation.

CNP director involvement in administrator organizations such as American Association of School Administrators (AASA), National School Boards Association (NSBA), and Association of School Business Officials International (ASBOI) is needed to educate administrators and school board decision makers about challenges of managing a CNP. Administrator and parent involvement also may generate support for the program.

Many improvements have been made in the commodity distribution program, although challenges remain. Education, communication among constituent groups, and further research are needed to continue to decrease non-value costs and improve nutrient content of USDA commodity foods in Child Nutrition Programs.

References


Table 6.1. Amount of Time CNP Directors and Staff Reported to Spend on Ordering, Receiving, and Tracking Commodity Foods \((N = 693)\)

<table>
<thead>
<tr>
<th>Hours per month spent by CNP directors</th>
<th>All States</th>
<th>NOI States</th>
<th>Non–NOI States</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n)</td>
<td>%(^a)</td>
<td>(n)</td>
</tr>
<tr>
<td>Less than 5 hours per month</td>
<td>373</td>
<td>57</td>
<td>193</td>
</tr>
<tr>
<td>5–9 hours</td>
<td>193</td>
<td>30</td>
<td>103</td>
</tr>
<tr>
<td>10–14 hours</td>
<td>53</td>
<td>8</td>
<td>33</td>
</tr>
<tr>
<td>15 or more</td>
<td>33</td>
<td>5</td>
<td>22</td>
</tr>
</tbody>
</table>

Estimated number of full–time equivalent staff (FTE)

<table>
<thead>
<tr>
<th>Estimated number of FTE</th>
<th>All States</th>
<th>NOI States</th>
<th>Non–NOI States</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n)</td>
<td>%(^a)</td>
<td>(n)</td>
</tr>
<tr>
<td>1–2 FTE</td>
<td>333</td>
<td>52</td>
<td>174</td>
</tr>
<tr>
<td>3–4 FTE</td>
<td>120</td>
<td>19</td>
<td>65</td>
</tr>
<tr>
<td>5–7 FTE</td>
<td>71</td>
<td>11</td>
<td>43</td>
</tr>
<tr>
<td>8–10 FTE</td>
<td>28</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>11 or more FTE</td>
<td>43</td>
<td>7</td>
<td>23</td>
</tr>
<tr>
<td>Do not know</td>
<td>19</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Other</td>
<td>31</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

\(^a\)Percent may not equal 100 due to rounding

Table 6.2. CNP Directors’ Estimated Delivery Costs Per Case or Per Pound \((N = 693)\)

<table>
<thead>
<tr>
<th>Cost</th>
<th>NOI (n)</th>
<th>%</th>
<th>Non–NOI (n)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per case $</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>26</td>
<td>9</td>
<td>22</td>
<td>12</td>
</tr>
<tr>
<td>.01 – .09</td>
<td>7</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>.10 – .49</td>
<td>27</td>
<td>10</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>.50 – .99</td>
<td>14</td>
<td>5</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>1.00 – 1.99</td>
<td>48</td>
<td>17</td>
<td>57</td>
<td>31</td>
</tr>
<tr>
<td>2.00 – 2.99</td>
<td>112</td>
<td>40</td>
<td>48</td>
<td>27</td>
</tr>
<tr>
<td>3.00 – 4.99</td>
<td>40</td>
<td>14</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>5.00 or more</td>
<td>19</td>
<td>3</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>Per pound $</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>31</td>
<td>34</td>
<td>29</td>
<td>45</td>
</tr>
<tr>
<td>.01 – .09</td>
<td>10</td>
<td>11</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>.10 – .49</td>
<td>23</td>
<td>25</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>.50 – .99</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>1.00 – 1.99</td>
<td>10</td>
<td>11</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>2.00 or more</td>
<td>10</td>
<td>10</td>
<td>7</td>
<td>11</td>
</tr>
</tbody>
</table>
Table 6.3. Costs Associated with Unused Commodity Foods, Processing, Administration, Storage, and Delivery as Reported by CNP Directors (N = 693)

<table>
<thead>
<tr>
<th>Cost incurred related to commodity use</th>
<th>Foodservice budget pays this fee</th>
<th>General district budget pays this fee</th>
<th>State pays fee</th>
<th>State pays but passes cost on to school district</th>
<th>Not part of program</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NOI</td>
<td>Non–NOI</td>
<td>NOI</td>
<td>Non–NOI</td>
<td>NOI</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Delivered at the end of school year</td>
<td>142</td>
<td>50</td>
<td>99</td>
<td>51</td>
<td>5</td>
</tr>
<tr>
<td>Delivered in unusable forms</td>
<td>126</td>
<td>45</td>
<td>85</td>
<td>45</td>
<td>8</td>
</tr>
<tr>
<td>Transferred to district late in school year; not requested</td>
<td>131</td>
<td>47</td>
<td>69</td>
<td>37</td>
<td>5</td>
</tr>
<tr>
<td>Delivered in quantity too large for district</td>
<td>117</td>
<td>42</td>
<td>70</td>
<td>38</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>57</td>
<td>39</td>
<td>40</td>
<td>37</td>
<td>2</td>
</tr>
<tr>
<td>Processing fee to manufacturer</td>
<td>263</td>
<td>81</td>
<td>175</td>
<td>81</td>
<td>6</td>
</tr>
<tr>
<td>Commodity coop fees</td>
<td>163</td>
<td>55</td>
<td>63</td>
<td>34</td>
<td>5</td>
</tr>
<tr>
<td>Paperwork; foodservice administrative time for reporting, tracking, verifying</td>
<td>298</td>
<td>90</td>
<td>194</td>
<td>92</td>
<td>15</td>
</tr>
</tbody>
</table>
Table 6.3. (continued)

<table>
<thead>
<tr>
<th>Cost incurred related to commodity use</th>
<th>Foodservice budget pays this fee</th>
<th>General district budget pays this</th>
<th>State pays fee</th>
<th>State pays but passes cost on to school district</th>
<th>Not part of program</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NOI n  %</td>
<td>Non–NOI n   %</td>
<td>NOI n  %</td>
<td>Non–NOI n   %</td>
<td>NOI n  %</td>
</tr>
<tr>
<td>Accounting staff salaries and benefits (district office)</td>
<td>179  56</td>
<td>121  57</td>
<td>88  27</td>
<td>65  31</td>
<td>2  1</td>
</tr>
<tr>
<td>Additional labor and equipment expenses to manage large truckload deliveries</td>
<td>176  56</td>
<td>117  56</td>
<td>45  14</td>
<td>36  17</td>
<td>1  0</td>
</tr>
<tr>
<td>District warehouse storage fees</td>
<td>179  58</td>
<td>101  51</td>
<td>27  9</td>
<td>26  12</td>
<td>2  1</td>
</tr>
<tr>
<td>State warehouse storage fees</td>
<td>181  60</td>
<td>57  30</td>
<td>5  2</td>
<td>4  2</td>
<td>10  3</td>
</tr>
<tr>
<td>Third party warehouse storage fees</td>
<td>129  46</td>
<td>93  50</td>
<td>2  1</td>
<td>3  2</td>
<td>6  2</td>
</tr>
<tr>
<td>Delivery charges to third party warehouse and distribution agent</td>
<td>149  51</td>
<td>90  46</td>
<td>4  1</td>
<td>3  2</td>
<td>6  2</td>
</tr>
<tr>
<td>Delivery charges to schools</td>
<td>249  79</td>
<td>160  75</td>
<td>20  6</td>
<td>15  7</td>
<td>1  0</td>
</tr>
<tr>
<td>Distributor storage fees</td>
<td>227  76</td>
<td>102  52</td>
<td>4  1</td>
<td>4  2</td>
<td>2  1</td>
</tr>
</tbody>
</table>

*Note.* Percentage may not total 100 because respondents were asked to select all that apply.
<table>
<thead>
<tr>
<th>Item</th>
<th>Mean ± SD</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nutrient content of a food product is important when making</strong></td>
<td>5.3 ± 0.8</td>
<td>0 0</td>
<td>4 1</td>
<td>3 1</td>
<td>73 11</td>
<td>282 41</td>
<td>243 35</td>
</tr>
<tr>
<td><strong>commodity purchase decisions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Further processed, fully cooked meat commodities reduce food</strong></td>
<td>5.0 ± 1.1</td>
<td>9 1</td>
<td>17 3</td>
<td>30 4</td>
<td>96 14</td>
<td>203 29</td>
<td>236 34</td>
</tr>
<tr>
<td><strong>safety concerns compared to bulk uncooked commodity foods</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Diverting bulk commodities to a manufacturer for further</strong></td>
<td>4.4 ± 1.2</td>
<td>12 2</td>
<td>40 6</td>
<td>48 7</td>
<td>176 25</td>
<td>215 31</td>
<td>91 13</td>
</tr>
<tr>
<td><strong>processing provides greater control of the nutrient content of</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>the end product</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nutrition is more important than cost when making a food</strong></td>
<td>4.4 ± 1.0</td>
<td>3 1</td>
<td>23 3</td>
<td>63 9</td>
<td>257 37</td>
<td>186 27</td>
<td>72 10</td>
</tr>
<tr>
<td><strong>purchase decision for Child Nutrition Programs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>I can divert bulk commodities to a manufacturer and receive a</strong></td>
<td>3.8 ± 1.1</td>
<td>17 2</td>
<td>51 7</td>
<td>116 17</td>
<td>265 38</td>
<td>105 15</td>
<td>21 3</td>
</tr>
<tr>
<td><strong>more nutrient dense end product than the further processed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>commodity foods offered by USDA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. Responses were made on a 6–point range (1 = strongly disagree, 6 = strongly agree)*
CHAPTER 7. SUMMARY AND CONCLUSIONS

Since USDA began providing surplus commodity foods to Americans in need during the Depression of the 1930s, the commodity program has benefited schoolchildren and agriculture producers. Throughout the commodity food program’s history, many changes have taken place within agriculture, family lifestyle, eating trends, child nutrition programs, food manufacturing, and distribution. These environmental changes created inefficiencies for all constituents of the commodity food program.

In 1998, USDA convened the Commodity Order Re-Engineering Team, known as the CORE team. The team identified barriers and problems in the commodity program and established an aggressive improvement plan (USDA, 1999, 2000). As result of the CORE team’s final report, many changes have been implemented to remove non-value costs from the commodity distribution system (USDA, 2003a, 2003b, 2003c, 2006c).

Although approved by USDA on the federal level, not all CNP directors have access to these cost saving systems. CNP directors depend on the state distribution agency to make commodity processing decisions for all school districts in the state and are limited to state-approved systems.

This research was designed to examine the use, costs, and value of commodity foods in states using net off invoice (NOI) and those not using NOI as a value pass through (VPT) system. Chicken and potatoes were used as commodity products to examine CNP directors’ attitudes toward diverting to manufacturers and nutrient content of commodities. The research also reported costs associated with using commodities in NSLP.

Findings from this research showed a majority of CNP directors responding to the survey divert most of their chicken and potato commodities to manufacturers for further
processing. A majority (72%) of survey respondents in both NOI and non-NOI states indicated that they prefer NOI. Several indicated in open-ended comments that they desire greater variety of foods, such as beef and pork, to be available through NOI.

When asked about unused commodity foods, 75% of CNP directors reported they had unused commodity food inventory at the end of the year and just over a third (36%) reported unused entitlement dollars remaining at the end of the school year. Significantly fewer CNP directors in NOI states reported commodity food inventory and entitlement dollars left at the end of the school year. Most (97%) stated end-of-year delivery as the reason for unused commodity food inventory.

This high percentage of CNP directors reporting unused food inventory and entitlement dollars indicates a need for more efficacious use of commodity foods. Commodity foods used in CNP can decrease the total amount of commercial foods purchased for school meals.

A review of the study research questions found the following results based on statistical analysis (Appendix G).

- Do CNP directors in NOI states report less unused commodity entitlement dollars and food inventory at the end of school year compared to directors in non-NOI states?
  - CNP directors in NOI states reported left over entitlement dollars and food inventory less frequently than directors in non-NOI states (p = 0.013).

- Do CNP directors in NOI states have different attitudes toward importance of nutrient content, cost, and convenience of commodity foods compared to directors in non-NOI states?
- CNP directors in NOI states reported a higher level of agreement that nutrient content was more important than cost when making food purchase decisions for CNP compared to directors in non-NOI states.
- A majority (75%) of CNP directors strongly agreed or agreed that further processed fully cooked forms of meat commodities reduced food safety concerns.

- Is NOI participation independent of use of ECOS?
  - A Chi-square test of independence found no difference between ECOS use in NOI states and non-NOI states.

- What department within the school district (foodservice or school district operations department) or state agency assumes responsibility for costs associated with using commodity foods such as storage and transportation of commodities?
  - Foodservice budgets are responsible for costs associated with commodity foods; the district does not cover the cost of commodity food storage or transportation from central warehouse to school buildings.

- Does average daily participation (ADP) relate to the time it takes to manage commodity foods?
  - There was no correlation between the average ADP and time reported by CNP directors to manage commodities. Results indicated that there was a curvilinear relationship between ADP and time spent on commodity management.

- What are CNP directors’ perceptions of nutrient content of commodity foods?
o A majority (65%) of all CNP directors responding to the questionnaire strongly agreed or agreed that USDA further processed commodities improved their ability to use commodities; 62% \((n = 431)\) strongly agreed or agreed that diverting commodities to manufacturers reduced labor costs; 54% \((n = 380)\) strongly agreed or agreed that there is a monetary benefit in the added cost of diverting bulk chicken and potato commodities to manufacturers for further processing; there was not a significant difference reported between directors in NOI and non-NOI states.

**Conclusions**

This study found the majority of CNP directors preferred NOI as a VPT method even if it were not available in their state. CNP directors in non-NOI states expressed a desire to have access to NOI. There also was a desire to see NOI used for more commodity products; beef and pork were specifically mentioned in survey results. The progress made in commodity distribution since USDA’s reengineering effort in 2000 appears to be accepted by CNP directors. As new processes are tested and approved, it will take a few years for the benefits of each new process to become mainstream and widely accepted by all states.

CNP directors in NOI states reported that NOI decreased storage costs and increased control of food choices and nutrient content of commodity foods. NOI was identified as allowing more flexibility over products offered to students and ease in menu planning with just-in-time delivery. The ability to change products as needed throughout the school year and to purchase a commercial equivalent when commodity food ran out were features that gave CNP directors more control in commodity decisions. CNP directors in the study reported students noticed when product brands changed midway through the school year.
In all states, the majority of CNP directors reported commodity food and entitlement dollars left at the end of the school year. CNP directors in non-NOI states reported higher quantities of food inventory and entitlement dollars left at the end of the school year compared with those in NOI states. End-of-year delivery was identified as the primary reason for left over commodities reported by 97% of those who had food remaining. These late deliveries required food to be stored over the summer, which increased product cost and contributed to quality deterioration of products. More research is needed to quantify total costs nationwide of remaining commodity food inventory and entitlement dollars.

NOI is a solution to end-of-year deliveries. NOI allows CNP directors to receive their commodity entitlement in the form of product credit to purchase products from distributors as needed. CNP directors must monitor product balances in their entitlement banks to use their commodity credit before the end of the year. Entitlement dollars left unused at the end of the year are food dollars that could have helped reduce commercial food costs and improve the financial status of the department.

Year round product procurement is a solution for product delivered at the end of the year. Allowing substitution for more products, as in the proposed rule for beef and pork (USDA, 2006f), will help eliminate product that is not available until later in the school year.

It is difficult to make broad generalizations about the commodity program due to different policies approved by each state agency, manufacturer, and distributor for each food product. Regulations that work for one product may not apply to another product due to manufacturing process and product characteristics such as perishability, form, and storage conditions. Although there are differences in state regulations, allowing CNP directors to
determine processing systems offered in their state would provide CNP directors greater control of program operations.

The state agency determines VPT systems available in a state. NOI requires approval of the state agency, distributors, and manufacturers. CNP directors should continue to present the benefits of new processing systems to colleagues and the state agency to increase awareness of new systems and encourage their use.

Survey results indicated CNP directors in NOI and non-NOI states had similar attitudes toward nutrition and cost of commodity foods. Nutrient content of school meals and serving foods students like were important to all CNP directors. Diverting bulk commodities for further processing helped CNP directors make better use of commodities. There was agreement among CNP directors that further processing of bulk commodities was beneficial for better control of product variety and nutrient content.

Use of ECOS is determined by state agencies and is not a decision of CNP directors. Although a state agency may not offer CNP directors to use ECOS to order commodities, the state agency may allow CNP directors to monitor commodity transactions with ECOS. State agencies are gradually introducing ECOS to recipient agencies. Since CNP directors are the largest recipient agency users of commodities, they may be the last group in the state to learn ECOS. Gradual introduction throughout a state allows state agency staff to become familiar with the system before all recipient agencies are required to use it (Cathie McCullough, USDA, personal communication, September 20, 2006).

Education opportunities for CNP directors related to commodities are needed. Networking at state and national shows will help CNP directors educate each other on best practices to maximize use of commodities. USDA’s increased presence at SNA’s Annual
National Conference with commodity education sessions has helped communicate the message that USDA is working to make the commodity program more efficient and useful to CNP directors and state agencies.

Future research with state commodity directors may provide insight on how state processing decisions are made. Several questions may be asked: What impact does the CNP director have on decisions of VPT systems and access to ECOS in the state? In addition, how much control does the state director have on end-of-year deliveries and what foods are delivered? Will increased availability of NOI for more food products reduce the amount of unused commodity food inventory and entitlement dollars left at the end of the school year?

To better utilize commodities and help eliminate end of school year deliveries, focus must be placed on designing menus around foods students want. Student satisfaction was reported as a high priority among CNP directors; therefore, it should be primary focus in menu development. Another consideration in commodity ordering should be what foods are available and when they are available. As Guthrie and Buzby (2002) suggested, improving the selection of commodity foods may be a strategy to decrease plate waste in CNP. Commodity offerings should be based on what is needed for menus to satisfy student preferences as well as those commodities available in the market. The goal is to increase participation and provide adequate nutrition to students. New systems allow CNP directors to plan menus based on food preferences of students, then request commodities from the state that will meet the needs of their districts. Use of NOI will eliminate end-of-year deliveries because foods are ordered from normal commercial distribution as needed and not shipped when processed by the state.
There is need for further research related to commodity processing. There is also an increased need for education and training for CNP directors on to commodity processing, NOI, and new cost saving systems. Additional demonstration projects and pilot tests are needed to continue the progress and momentum initiated with *Food Distribution 2000* re-engineering efforts. Programs removing non-value-added costs, such as ECOS, should be strongly encouraged for use in all states, and research should be conducted to quantify cost savings and efficiencies offered by new systems. Future research is needed to measure progress toward resolving commodity food barriers identified in *Food Distribution 2000*. 
REFERENCES


APPENDIX A. FOCUS GROUP DISCUSSION GUIDE

Overall Goals:
- Identify the cost of using commodity foods in Child Nutrition Programs (CNP)
- Determine the challenges of using commodity foods
- Identify strengths of the commodity distribution program
- Determine the nutrition benefits of using commodity foods-for students
- Identify best practices of effective commodity management

Introduction:
- Barbara Jirka, PhD student at ISU, CNP Academy. This focus group is being conducted for research that is not representing any company, research is not sponsored, I am here as a student.
  - Jeannie Sneed will be observer, taking notes, helping watch time
- Housekeeping:
  - Begin discussion at 8:00 and will finish by 9:30. CNIC general session begins 10:30
  - Please take a break whenever needed, this will be an informal session.
- Ground Rules
  - Discussion today will be used to identify key areas of cost and nutrient issues with commodity foods and help shape the research questionnaire that will be sent to school foodservice directors. Survey results will be analyzed and reported, as part of my dissertation research, as well as a historical perspective of the USDA commodity program.
  - Welcome all comments, this is “work in progress”
  - All comments will be helpful, there are no right or wrong answers.
  - This is ISU research, want to remind you that your participation is voluntary, you do not have to answer any questions if you do not want to, you can leave at any time. Your conversation is confidential, no names associated with comments, just used for this research study.
  - As we discuss things if you think of something, please write it down, I would like to collect your thoughts after the discussion, as it will help sort through the notes.
  - The discussion will be tape recorded to help recall your thoughts.
- Goal is to gather attitudes and perceptions and broaden my perspective (qualitative data). Everyone in the room may have different responses to the same question. Information is to be used to develop questions for a research survey. Since this is the initial phase of data collection, the purpose of the focus group will be to explore thoughts and ideas and provide me, the researcher, background on how directors manage their commodities. Every state processes and distributes commodities differently, so please share your experiences and if you are aware of differences in other states.
Participant introductions:
  
  - Name, school/city/state, school size, past experience in using section 32-commodities, positive or negative.

Discussion Topics:

**Topic 1: What to buy with section 32 funds.**

*(Why? How? Explain—can you tell me more about that?)*

What do you think of when you hear “Section 32 funds”?

How do you determine what commodity foods to purchase with section 32 funds?

1.1 What is the first thing you look for? What criteria do you use?

1.2 What are the first foods you look for? Why?

1.3 What is the first thing you look for? What criteria do you use?

1.4 Is there one food item you buy all the time? Why?

1.5 Is there something that you would like to see offered that is not?

1.6 What is your biggest challenge? What help do you need? From who? What format?

1.7 Rank the top 5 sources of hidden costs to using section 32 funds.

1.8 Do you feel the time spent on ordering, processing, and tracking USDA commodity is adequate for the value of commodity food your school receives?

**Topic 2: Buy as offered or divert to process into other forms.**


Do you buy commodities in forms provided by USDA or do you divert to manufacturers to process into other forms?

2.1 How do you make that decision?

2.2 What % do you buy from USDA “as offered”?

2.3 What items do you buy “as offered”?

2.4 Do you think the nutritional value is better with commodities as offered or when you divert to have commodities processed in your choice of forms?

2.5 Would you buy other forms of that item if offered? What? Why?

2.6 How can current commodity offerings be improved?

**Topic 3: Cost of using commodities**

*(Probe: Why? How? Can you tell me more about that? Explain)*

How do you determine the cost of each commodity item you buy?

3.1 What are the hidden costs of using commodity foods?

  - Who pays them? How?

3.2 What about warehouse staff time, driver time, administrative work time, accounting?

3.3 What and how much do you get assessed from district for expenses/services—electricity? Custodial?

3.4 What % of your total section 32 funds really applies to the food?

3.5 Have you calculated the cost per serving—what % is associated with the hidden costs?

3.6 What % is labor cost?

3.7 What is the largest % hidden cost?
3.8 What can you do to reduce hidden costs?
3.9 What factors should be in a costing model?

**Topic 4: Nutrition benefits of commodities**
4.1 Do you feel the current commodity offerings/forms are the best nutritionally?
4.2 What is that is different than what’s offered today?-(forms-nutritionally)
4.3 Other nutrition related comments regarding commodities?

**Summary & Conclusion:**
IS THERE ANYTHING ELSE YOU WANT TO BRING UP?
What is your biggest challenge in using Section 32 funds?
How do you manage those challenges?
Is training on effective management of commodities needed?
What is the best way to get training on effectively managing commodities?
Where can you go for help?

Preliminary Analysis Plan: Take the time immediately following the focus group to debrief with advisor. This will be more important than attending the opening general session of the conference. A tape recording will be made of the focus group and debrief session to capture the thoughts and summarize issues that were repeated or stood out to the group.

Discussion format used for focus group. Field notes will be axial coded for common themes.
APPENDIX B. FOCUS GROUP RESULTS

Sunday, January 15, 2006

How do school foodservice directors think about Section 32 funds?

- No one thinks of section 32
- Everything is section 32
- This has no meaning to directors
- All they can use monies for is commodity foods

Wisconsin
- No diversion to schools, the state agency makes decisions
- State processed items may not be as nutritious as one purchased, i.e. corn dog

Ohio
- Purchasing cooperative now can do processing, i.e. cheese can be diverted
- Directors can now document what is purchased so it has more value
- Nutritional value is number one in making decisions—now directors can have more choices
- More buying power, decisions are made by the purchasing group.
- They can now set their own criteria and have more voice about what they will purchase
- Small districts often feel they have no voice, value—but they can interact with students.
- For a purchasing cooperative, size of district makes no difference.

What does the term commodities mean to directors?

The term commodity means different things to different people.
Some view a commodity as “free” which may connote “funny money”
Some view a commodity as flour, sugar, etc.

Cheese processing—gets dollars back

What are issues with the state purchasing/handling of commodities?

Differences in state decisions—closed versus open
Options vary so much by state that it is confusing.

There often is a “power play” at the state level—they tell schools what to buy. Cooperatives threaten that. Cooperatives often do not use the state system.

Cooperative:  1) Foodservice Directors
2) DJ Cooperative works directly with United States Department of Agriculture (USDA)—bypass state

Costs 10-12 cents per case

Ohio—state controlled quantities of each item

One problem at the state level is that you have people in charge of purchasing with no foodservice experience.

USDA does not mandate a commodity council. Smaller districts have a harder time using commodities because of
- Storage space limitations
- Inventory control issues

Take commodity program for what it is—states muddle it up!!

Districts “trade” commodities. Good fiscal management is required.

**What are the costs of using commodities?** Note: school districts pay for “free” commodities.

- Storage
  - May be required to store large quantities.
  - Purchasing cooperatives may make weekly deliveries or just-in-time deliveries
- Impacts menu decisions. Must make a conscious effort to menu commodity items. Some items are difficult to plan into menus.
- Inventory management required. You may want to pose a question related to the frequency of turnover of commodities.
- May need to purchase freezers.
- Labor costs in handling the inventory
- Delivery fees vary dramatically. Estimated cost: $.50 for dry cases; $1.00 for frozen cases.
- Worker’s Comp claims of workers—handling heavy products. Workers are not as strong as they used to be! Perhaps an older workforce.
- May need to remodel—docks with elevators
- May need to purchase pallet jacks
- May need to hire an employee in the district to deliver to schools.
- May need to purchase a refrigerated truck to make deliveries.
- Reduces purchasing power from local purveyors.
- May have to pay a per case charge to a central warehouse to store and deliver product.
• Administration costs—may be 2-3 cents per pound.
• Storage fee
• Waste—un-inspected deliveries or recalls. For example, there was a breaded catfish commodity that was popular in some districts that was recalled. The delivery and storage costs were already paid by the district and could not be recovered.
• A commercial equivalent for the commodity is required so that you can continue to menu the item when it is no longer available as a commodity. Students may like an item very much; it is part of a cycle menu. There also needs to be comparisons based on:
  o Nutrition
  o Taste (acceptability)
• Labor costs
  o Processed vs. raw products
  o Warehouse
  o Delivery costs
• Some items can be purchased commercially less expensively than the commodity. How do I compare commodity vs. open market purchasing? May be able to purchase an open market product cheaper than commodity when all of the hidden costs are considered.
• Processing cost

Wisconsin—direct distribution—weekly distribution by prime vendor. Fee of $1.70 per case to distributor for picking up commodities from state warehouse and delivery to district. Commodities are picked up with school’s name on the product.

Missouri—pay off the top for delivery—therefore, you get less food as a result.

Need to pick and choose products to purchase with commodity dollars. For example, you would not get flour at $2.75 delivery fee.

Try to get direct delivery from USDA.

Wisconsin—processed, precooked commodities—there is a concern related to food safety and HACCP

Canned goods are selected first because you only have to pay a delivery charge. Chicken has no value in processing

USDA web site needs ingredient lists. There is a nutrition label, but there is not an ingredient list posted.

**What about Department of Defense (DOD) items?**

DOD produce—you pay 5.5 to 6% to DOD for doing nothing. They deliver only to one site. Prefer cash to purchase produce.
“gold plated garbage disposal” for USDA
DOD—provides variety and form of foods that kids like
Encourages use of DOD dollars to purchase food
Each state has DOD dollars that allow school districts to get produce at times of year that
produce may not be available or cost too much.
Take commodity out of reimbursement.

Some districts manage commodities for parochial schools. They lower the price of meals
because schools get check for commodities.

Buy stuff with DOD dollars that you would not buy otherwise.

Sometimes don’t have option but to take raw products (forced products). This creates labor,
equipment, etc. issues.

Results should be shared through a NFSMI teleconference; SNA journal articles

Refer to the General Accounting Office (GAO) study on commodities, recently done.

Taco mix: turkey/pork higher in fat than beef/pork mix

Open items or brown box (canned vegetables, fruits, etc.)
Processed items.

Waste issue should be considered

Economics—popularity

Finance is the priority

Size of school district impacts:
- Big districts can divert—ex. cheese—because of volume
- About $12/case for potatoes; purchase commercially for $11/case

Acceptability varies by district

Flow chart process

Questions to ask:
  1. Are you using all of your commodity dollars?
  2. Do you have inventory at the end of the year?
APPENDIX C. SURVEY QUESTIONNAIRE

Value of Commodity Foods in Child Nutrition Programs

The school foodservice director or their designee responsible for managing the procurement of United States Department of Agriculture (USDA) commodity foods should complete this questionnaire. All responses are confidential. Email addresses are not linked to survey responses. Participation in this research will help provide information on the cost and nutritional value of commodity foods used in Child Nutrition Programs (CNP).

Please respond to this survey based on the commodity program for your state and school district for the 2005-06 school year. The survey takes about 15 minutes to complete. Please select the option that best describes your response to each question.

Part 1. COST OF COMMODITY FOODS
1. Did you use all your commodity entitlement dollars for school year 2005-06?
   a. Yes
   b. No

2. Did you have unused commodity food inventory left at the end of school year 2005-06?
   a. Yes
   b. No

3. If you had unused entitlement dollars or commodity food inventory left at the end of the school year, indicate the reason(s) it was not used. Select all that apply.
   Commodity item: chicken Identify reason not used:
   a. End-of-year delivery
   b. Commodity delivered in form not useable in our program
   c. Students do not eat the item
   d. Inadequate quantity to serve all students
   e. Usage did not match what was diverted
   f. Not enough of this commodity offered to us
   g. More commodity accepted than what could be utilized
   h. Did not request or receive this commodity

   Commodity item: potatoes Identify reason not used:
   a. End-of-year delivery
   b. Commodity delivered in form not useable in our program
   c. Students do not eat the item
   d. Inadequate quantity to serve all students
   e. Usage did not match what was diverted
   f. Not enough of this commodity offered to us
   g. More commodity accepted than what could be utilized
   h. Did not request or receive this commodity
4. What value pass through method do you use for processing your chicken commodity entitlement?
   a. **Net Off Invoice- (NOI)**- commodity end products are purchased through regular distribution, with a net price for cost of commodity value discounted from distributor invoice
   b. **Fee for service (FFS)**- manufacturer is paid a fee for processing commodity food
   c. **Rebate**- school submits a refund to manufacturer to receive commodity credit
   d. **Other value pass through method**, please specify (Text Box Included)

5. What value pass through (VPT) method do you use for processing your potato commodity entitlement?
   a. **Net Off Invoice- (NOI)**- commodity end products are purchased through regular distribution, with a net price for cost of commodity value discounted from distributor invoice
   b. **Fee for service (FFS)**- manufacturer is paid a fee for processing commodity food
   c. **Rebate**- school submits a refund to manufacturer to receive commodity credit
   d. **Other value pass through method**, please specify (Include Text Box)

6. Estimate the amount of time each month that you spent ordering, processing, and tracking commodity food purchases?
   a. Less than 5 hours per month
   b. 5 – 10 hours per month
   c. 10 – 15 hours per month
   d. 15 or more hours per month

7. What is the estimated total number of Full Time Equivalent (FTE) staff who handle commodities in your district? Use your best estimate and include all aspects of ordering, receiving, storage, delivery, inventory management, and transportation (includes delivery from a central district warehouse to school buildings).
   a. 1 – 2 Full Time Equivalent (FTE) staff
   b. 3 – 4 FTE staff
   c. 5 – 7 FTE staff
   d. 8 –10 FTE staff
   e. 11 or more people
   f. Do not know
   g. Other, please specify (text box)

8. Approximately what percentage of your chicken commodity do you divert to a manufacturer for further processing?
   a. Less than 25%
   b. 25% - 49%
   c. 50% - 74%
   d. 75% or more
9. Approximately what percentage of your commodity potatoes do you divert to a manufacturer for further processing?
   a. Less than 25%
   b. 25% - 49%
   c. 50% - 74%
   d. 75% or more

10. Below are storage and delivery costs associated with commodity foods. Select the budget that pays for those costs for your district.

<table>
<thead>
<tr>
<th>Cost incurred related to commodity use (Select all that apply)</th>
<th>Foodservice budget pays this fee</th>
<th>General district budget pays this fee</th>
<th>State Pays this fee</th>
<th>State pays and passes cost on to school district</th>
<th>This cost is not part of our commodity program</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.) District warehouse storage fees (includes warehouse staff salaries, benefits, building, and other)</td>
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<td>b.) State warehouse storage fees</td>
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<td>c.) Third party warehouse storage fees (warehouse not owned by district or state)</td>
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<td>d.) Delivery charges to third party warehouse and distribution agent</td>
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<td>e.) Delivery charges to schools (includes staff salaries, benefits, vehicles, fuel, and insurance)</td>
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<td>f.) Distributor storage fees</td>
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</table>

11. Below are processing and administrative costs associated with commodity foods. Select the budget that pays for those costs for your district.

<table>
<thead>
<tr>
<th>Cost incurred related to commodity use (Select all that apply)</th>
<th>Foodservice budget pays this fee</th>
<th>General district budget pays this fee</th>
<th>State Pays this fee</th>
<th>State pays and passes cost to school district</th>
<th>This cost is not part of our commodity program</th>
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<tbody>
<tr>
<td>a.) Processing fee to manufacturer</td>
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<td>b.) Commodity coop fees</td>
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<td>c.) Paperwork-foodservice administrative time for reporting, tracking, verifying</td>
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<tr>
<td>d.) Accounting staff salaries and benefits (district office)</td>
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<td>e.) Additional labor and equipment expenses to manage large truckload deliveries</td>
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</tbody>
</table>
12. Below are costs associated with unused commodity foods. Select the budget that pays for those costs for your district.

<table>
<thead>
<tr>
<th>Cost incurred related to commodity use</th>
<th>Foodservice budget pays this fee</th>
<th>General district budget pays this fee</th>
<th>State pays fee</th>
<th>State pays and passes cost on to school district</th>
<th>This cost is not part of our commodity program</th>
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<tbody>
<tr>
<td>a.) Waste of unused commodity foods that were delivered at the end of the school year.</td>
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<td>b.) Waste of commodity foods that are delivered in unusable forms.</td>
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<td>c.) Unused commodity food or entitlement dollars transferred to your district late in school year that was not requested</td>
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<td>d.) Waste of unused commodity foods that were delivered in a quantity too large for district size.</td>
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<td>e.) Other not listed above, please specify</td>
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13. Estimate delivery costs from your local distributors (per case or per pound) for frozen further processed or bulk commodities. (select best category)

<table>
<thead>
<tr>
<th>Per Case</th>
<th>Per Pound</th>
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<tbody>
<tr>
<td>a. $0</td>
<td>j. $0</td>
</tr>
<tr>
<td>b. $.01 - $.09</td>
<td>k. $.01 - $.09</td>
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<td>c. $.10 - $.49</td>
<td>l. $.10 - $.49</td>
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<td>d. $.50 - $.99</td>
<td>m. $.50 - $.99</td>
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<tr>
<td>e. $1.00 - $1.99</td>
<td>n. $1.00 - $1.99</td>
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<td>f. $2.00 - $2.99</td>
<td>o. $2.00 - $2.99</td>
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<td>g. $3.00 – $4.99</td>
<td>p. $3.00 – $4.99</td>
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<td>h. $5.00 - $9.99</td>
<td>q. $5.00 - $9.99</td>
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<td>i. $10.00 or more</td>
<td>r. $10.00 or more</td>
</tr>
</tbody>
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14. Which Value Pass Through system do you think would be best to use (even if you have not used or cannot use in your state)?

a. Net off invoice (NOI)- commodity end products are purchased through regular distribution, with a net price for cost of commodity value discounted from distributor invoice

b. Fee for service (FFS)- manufacturer is paid a fee for processing commodity food

c. Rebate- school submits a refund to manufacturer to receive commodity credit

d. Other value pass through method, please specify (text box)
Please indicate your level of agreement with each of the following statements by selecting the appropriate choice.

1 = Strongly Disagree  
2 = Disagree  
3 = Somewhat Disagree  
4 = Somewhat Agree  
5 = Agree  
6 = Strongly Agree

15. There is a monetary benefit in the added cost of diverting bulk chicken and potato commodities to manufacturers for further processing.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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16. The added cost to further process bulk chicken and potato commodities prevents me from using this option.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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17. USDA further processed commodities improve my ability to use commodities in my school district foodservice program.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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18. Diverting bulk commodities to commercial manufacturers reduces labor costs in my school district foodservice program.

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<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
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<th>Strongly Agree</th>
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19. Diverting bulk commodities for further processing allows me to serve USDA commodities in a form that my students like.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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20. Some food items with equal specifications can be purchased commercially less expensively than the commodity foods provided by USDA.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
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<th>Strongly Agree</th>
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21. Using net off invoice (NOI) that allows just-in-time delivery makes it easier for me to plan menus using commodity foods compared to other value pass through methods.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
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<th>Strongly Agree</th>
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Part 2. NUTRIENT CONTENT OF COMMODITY FOODS

INSTRUCTIONS: Please indicate your level of agreement with each of the following statements by selecting the appropriate choice.

1 = Strongly Disagree
2 = Disagree
3 = Somewhat Disagree
4 = Somewhat Agree
5 = Agree
6 = Strongly Agree

22. Nutrient content of a food product is important when making commodity purchase decisions.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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23. Diverting bulk commodities to a manufacturer for further processing provides greater control of the nutrient content of the end product.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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24. Nutrition is more important than cost when making a food purchase decision for Child Nutrition Programs.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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25. Generally, I can divert bulk commodities to a manufacturer and receive a more nutrient dense end product that is lower in fat and sodium than the further processed commodity foods offered by USDA.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
26. Further processed, fully cooked forms of meat commodities reduce food safety concerns compared to bulk uncooked forms of commodity foods.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

In the next two questions, please indicate the commercial manufacturer and code number of the product you use most often when further processing your chicken and potato commodity diversion. This information will assist in the nutrition content analysis portion of this research.

27. If you divert bulk commodity chicken to a commercial manufacturer, what manufacturer and product code number do you use most often?
   Manufacturer _____________________ code number ____________________

28. If you divert bulk commodity potatoes to a commercial manufacturer, what manufacturer and product code number do you use most often?
   Manufacturer _____________________ code number ____________________

Part 3. DEMOGRAPHIC INFORMATION ABOUT YOUR SCHOOL DISTRICT

INSTRUCTIONS: Please answer the following questions about your school district and yourself to help us analyze results of this questionnaire.

29. Indicate the state in which your school district is located
   a. Florida
   b. Georgia
   c. Illinois
   d. Massachusetts
   e. Missouri
   f. Pennsylvania
   g. Texas
   h. Washington

30. What is your school district enrollment?
   a. 5,000 students or less
   b. 5,000 - 9,999 students
   c. 10,000 - 24,999 students
   d. 25,000 - 49,999 students
   e. 50,000 - 100,000 students
   f. 100,000 students or more

31. What is your Average Daily Participation (ADP)?
   a. 4,999 students or less
   b. 5,000 – 9,999 students
c. 10,000 – 14,999 students
d. 15,000 – 24,999 students
e. 25,000 – 49,999 students
f. 50,000 – 74,999 students
g. 75,000 – 99,999 students
h. 100,000 students or more

32. Estimate the total annual dollars spent by your district for food and beverages for Child Nutrition Programs (CNP) during school year 2005-06.
   a. $99,000 or less
   b. $100,000 - $499,999
   c. $500,000 - $999,999
d. $1,000,000 - $1,999,999
e. $2,000,000 - $4,999,999
   f. $5,000,000 - $9,999,999
g. $10,000,000 - $14,999,999
   h. $15,000,000 - $49,999,999
   i. $50,000,000 - $99,999,999
   j. $100,000,000 or more

33. What is the estimated Planned Assistance Level (PAL) dollar value of allocated commodity foods your school district receives? (This does not include bonus commodities.)
   \[ \text{PAL} = \text{ADP} \times \# \text{school days} \times 0.175 \text{USDA commodity reimbursement rate} \]
   a. $49,999 or less
   b. $50,000 - $99,999
   c. $100,000 - $199,999
d. $200,000 - $299,999
e. $300,000 - $499,999
   f. $500,000 - $799,999
g. $800,000 - $999,999
   h. $1,000,000 or more

34. Is your school district a member of any of the following group purchasing organizations?
   a. A purchasing cooperative
   b. Group Purchasing Organization (GPO)?
c. None of the above
d. Other, please specify (test box)

35. Is your school district foodservice program managed by a foodservice management company? (select one)
   a. Yes
   b. No
36. Which of the following facilities you have in your school district? (check all that apply)
   a. central foodservice warehouse owned by school district
   b. central district freezer owned by school district
   c. rent food storage warehouse
   d. rent food storage freezer
   e. transportation vehicles/trucks for warehouse deliveries
   f. one or more central kitchens that transport meals to satellite kitchens
   g. full production kitchens in each school
   h. school receive meals in bulk from production kitchen
   i. school receive pre-plated meals from production kitchen

37. Indicate the predominant preparation/production format used at your school district:
   a. Majority of menu items prepared from scratch
   b. Majority of menu items are heat and serve products
   c. Equal mix of menu items prepared from scratch and heat and serve products
   d. Other, please specify (text box)

38. Did you have the option to order commodities using USDA’s Electronic Commodity
    Ordering System (ECOS) for school year 2005-06? (select one)
   a. Yes
   b. No (if no, skip to #39)

39. If yes to number 38, did you use ECOS to order commodity foods during the past school
    year (2005-06)? (select one)
   a. Yes
   b. No

40. What is your title?
   a. Foodservice Director
   b. School Business Official
   c. Foodservice Supervisor
   d. Commodity Manager
   e. Commodity Coordinator
   f. Area Manager
   g. School Kitchen Manager
   h. Cook
   i. Other, please specify (text box)_______________________________

41. Which of the following best describes your education level:
   a. High school
   b. Some college
   c. Associate degree
   d. Bachelor degree
   e. Graduate degree
42. Are you credentialed as a School Foodservice & Nutrition Specialist (SFNS)?
   a. Yes
   b. No

43. How many years have you been in your position of managing your school district’s commodity program?
   a. Less than 1 year
   b. 1 – 5 years
   c. 5 – 10 years
   d. 10 – 15 years
   e. 15 years or more

44. Please share other comments you have regarding the cost or nutrition content of USDA bulk or further processed commodity foods in relation to Net Off Invoice (NOI) or other value pass through method. (text box)

If you would like a copy of the results of this study, please send an email to me at barbj@iastate.edu. Please do not request results in the box in the previous question, as your email address is not linked to this survey.

Thank you very much for your participation in this research. If you have questions, please contact barbj@iastate.edu.
APPENDIX D. FIRST EMAIL LETTER AND SURVEY LINK

August 1, 2006

Dear School Foodservice Director:

You are aware of the vital role commodity foods play in your school district’s foodservice program. Efficient use of commodity foods adds value to your Child Nutrition Program. There is a need to maximize utilization of commodity foods. I am a PhD student in the Child Nutrition Leadership Academy at Iowa State University conducting research on the cost and nutrient content of commodities.

Your state has been selected to participate in the survey as one of four states that use net off invoice (NOI) as a value pass through method or one of four states that do not use NOI. Your help with this research will provide insight into cost and nutrient content of commodity foods. The results will be shared with school foodservice directors and with USDA to provide information on the commodity program at the school district level.

A survey questionnaire is attached in the URL link in this letter. Please access and complete the on-line survey questionnaire using the link below by August 22, 2006. To access the survey questionnaire, use Control key (Ctrl) and left click your mouse button. You can also copy and paste the URL link into your Internet browser to access to the survey.

http://www.surveymonkey.com/s.asp?u=655072399626

Your responses are confidential and not linked to survey results. If you have questions about the rights of research subjects or related injury, please contact the Office of Research Assurances, 2810 Beardshear Hall, Iowa State University, 515-294-3315; dament@iastate.edu.

Thank you very much for your help! Your participation in this research is greatly appreciated. Should you want a summary of results, please email your request to me at barbj@iastate.edu, as your email address is not linked to the survey.

Sincerely,

Barbara Jirka, SFNS
PhD Candidate
31 MacKay Hall
Ames, IA 50011-1120
Phone: 479-841-1159
Email: barbj@iastate.edu

Jeannie Sneed, PhD, RD, SFNS
Professor
18B MacKay Hall
Foodservice and Lodging Management
Iowa State University
Phone: 515-294-8474
Email: jsneed@iastate.edu
APPENDIX E. SECOND EMAIL LETTER AND SURVEY LINK

August 7, 2006

Dear School Foodservice Director,

Last week you received a commodity foods research survey invitation. If you have already completed the survey, thank you very much for your reply and your contribution to Child Nutrition Program research.

If you have not completed the survey, please take a few minutes to provide your thoughts on the costs and nutrient content of commodity foods. Your input will provide useful information that could affect the commodity program. Please complete the survey by Tuesday, August 22, 2006.

For your convenience, you can access the questionnaire using the link below by pressing the Control key (Ctrl) and left click your mouse button. You can also copy and paste the URL link into your Internet browser to access to the survey.

http://www.surveymonkey.com/s.asp?u=655072399626

Your responses are confidential and your email address is not linked to survey responses. If you have questions about the rights of research subjects or related injury, please contact the Office of Research Assurances, 2810 Beardshear Hall, Iowa State University, 515-294-3315; dament@iastate.edu.

Thank you very much for your help! Should you want a summary of results, please email your request to me at barbj@iastate.edu as your email address is not linked to the survey.

Sincerely,
Barbara Jirka, SFNS
PhD Candidate
31 MacKay Hall
Iowa State University
Phone: 479-841-1159
Email: barbj@iastate.edu

Jeannie Sneed, PhD, RD, SFNS
Professor
18B MacKay Hall
Foodservice and Lodging Management
Iowa State University
Phone: 515-294-8474
Email: jsneed@iastate.edu
August 15, 2006

Dear School Foodservice Director,

You may have already completed the research survey on commodity foods that you received about two weeks ago. Thank you for your reply and your contribution to Child Nutrition Program research.

If you have not completed the survey, this is another opportunity to access the survey questionnaire. Please take a few minutes to provide your thoughts on the costs and nutrition content of commodity foods. Your input will help provide useful information on the commodity program. The survey will only take 15 minutes. Your response is requested by **Tuesday, August 22, 2006**.

For your convenience, you can access the questionnaire using the link below by pressing the Control key (Ctrl) and left click your mouse button. You can also copy and paste the URL link into your Internet browser to access to the survey.

http://www.surveymonkey.com/s.asp?u=655072399626

Your responses are confidential and not linked to your email address. If you have questions about the rights of research subjects or related injury, please contact the Office of Research Assurances, 2810 Beardshear Hall, Iowa State University, 515-294-3315; dament@iastate.edu.

Should you want a summary of results, please email your request to me at barbj@iastate.edu as your email address is not linked to the survey.

Thank you for your help with this research.

Sincerely,

Barbara Jirka, SFNS PhD Candidate
31 MacKay Hall
Iowa State University
Phone: 479-841-1159
Email: barbj@iastate.edu

Jeannie Sneed, PhD, RD, SFNS Professor
18B MacKay Hall
Iowa State University
Phone: 515-294-8474
Email: jsneed@iastate.edu
APPENDIX G. STATISTICAL ANALYSES FOR RESEARCH QUESTIONS

Research Question 1: Do CNP directors in NOI states report less unused commodity dollars and food inventory at the end-of-year compared to CNP directors in non-NOI states?

Research question 1 corresponds to questionnaire items 1, 2, and 29 and can be expressed as contingency tables (Table G-1 and G-2).

Table G-1. CNP Directors Reporting Leftover Entitlement Dollars for NOI Compared to Non NOI States

<table>
<thead>
<tr>
<th></th>
<th>All Entitlement Dollars Used</th>
<th>Left Over Entitlement Dollars</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOI</td>
<td>250</td>
<td>103</td>
<td>353</td>
</tr>
<tr>
<td>Non NOI</td>
<td>121</td>
<td>110</td>
<td>231</td>
</tr>
<tr>
<td>Total</td>
<td>371</td>
<td>213</td>
<td>584</td>
</tr>
</tbody>
</table>

The specific statistical hypothesis tested:

$H_0$: $p \text{ NOI} = p \text{ non NOI}$

$H_A$: $p \text{ NOI} < p \text{ non NOI}$

Where $p \text{ NOI}$ is the proportion of responses from NOI states with left over entitlement dollars:

$p \text{ NOI} = 103/353 = 0.29$, and $p \text{ non NOI}$ is the proportion of responses from non NOI states with left over entitlement dollars:

$p \text{ non NOI} = 110/231 = 0.48$.

The hypothesis was tested using a one-tailed Fisher’s exact test. Fisher’s exact test resulted in a p-value less than 0.0001, suggesting the null hypothesis can be rejected. The data indicate directors for NOI states reported left over entitlement dollars less frequently than non NOI states.

Table G-2. CNP Directors Reporting Leftover Food Inventory for NOI Compared to Non-NOI States

<table>
<thead>
<tr>
<th></th>
<th>All Food Inventory Used</th>
<th>Left Over Food Inventory</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOI</td>
<td>94</td>
<td>261</td>
<td>355</td>
</tr>
<tr>
<td>Non NOI</td>
<td>44</td>
<td>187</td>
<td>231</td>
</tr>
<tr>
<td>Total</td>
<td>138</td>
<td>448</td>
<td>586</td>
</tr>
</tbody>
</table>

The specific statistical hypothesis tested:

$H_0$: $p \text{ I NOI} = p \text{ I non NOI}$

$H_A$: $p \text{ I NOI} < p \text{ I non NOI}$

Where $p \text{ I NOI}$ is the proportion of responses from NOI states with left over food inventory:

$p \text{ I NOI} = 261/355 = 0.74$,

and $p \text{ I non NOI}$ is the proportion of responses from non NOI states with left over entitlement dollars:
The hypothesis was again be tested using a one-tailed Fisher’s exact test. Fisher’s exact test resulted in a $p$-value of 0.03. However, at the $\alpha = 0.05$ level of significance the null hypothesis can be rejected. The data indicate directors for NOI states reported left over food inventory less frequently than non-NOI states.

**Research Question 2: Do CNP directors in NOI states have different attitudes toward importance of nutrition, cost, and convenience of commodity foods compared to CNP directors in non-NOI states?**

Questionnaire items 15-26 measure directors’ attitudes toward the importance of nutrition cost, and convenience of commodity foods. Responses were ordinal (1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree). T-tests were used to compare the average magnitude of response, for each of the 12 questionnaire items. Specifically the following hypotheses were tested for each item:

$H_0: \mu_{\text{NOI}} = \mu_{\text{non NOI}}$

$H_A: \mu_{\text{NOI}} \neq \mu_{\text{non NOI}}$

Where $\mu_{\text{NOI}}$ is the average response for directors from NOI states and $\mu_{\text{non NOI}}$ is the average response for directors from non-NOI states. The results are summarized in Table G-3.

<table>
<thead>
<tr>
<th>Question</th>
<th>State Type</th>
<th>Mean</th>
<th>Sample Size</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>NOI</td>
<td>4.5780</td>
<td>346</td>
<td>0.1897</td>
</tr>
<tr>
<td></td>
<td>Non NOI</td>
<td>4.7230</td>
<td>213</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>NOI</td>
<td>2.8783</td>
<td>345</td>
<td>0.9950</td>
</tr>
<tr>
<td></td>
<td>Non NOI</td>
<td>2.8791</td>
<td>215</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>NOI</td>
<td>5.0207</td>
<td>338</td>
<td>0.8290</td>
</tr>
<tr>
<td></td>
<td>Non NOI</td>
<td>5.000</td>
<td>222</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>NOI</td>
<td>4.8118</td>
<td>340</td>
<td>0.5990</td>
</tr>
<tr>
<td></td>
<td>Non NOI</td>
<td>4.8670</td>
<td>218</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>NOI</td>
<td>5.1130</td>
<td>345</td>
<td>0.6629</td>
</tr>
<tr>
<td></td>
<td>Non NOI</td>
<td>5.0717</td>
<td>223</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>NOI</td>
<td>3.9157</td>
<td>344</td>
<td>0.4982</td>
</tr>
<tr>
<td></td>
<td>Non NOI</td>
<td>3.9955</td>
<td>224</td>
<td></td>
</tr>
<tr>
<td>21**</td>
<td>NOI</td>
<td>5.1623</td>
<td>308</td>
<td>0.0002</td>
</tr>
<tr>
<td>Question</td>
<td>State Type</td>
<td>Mean</td>
<td>Sample Size</td>
<td>p-value</td>
</tr>
<tr>
<td>----------</td>
<td>------------</td>
<td>------</td>
<td>-------------</td>
<td>---------</td>
</tr>
<tr>
<td>Question State Type Mean * Sample Size p-value</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non NOI</td>
<td>4.8034 b</td>
<td>178</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>NOI</td>
<td>5.2295 a</td>
<td>353</td>
<td>0.3464</td>
</tr>
<tr>
<td>Non NOI</td>
<td>5.2895 a</td>
<td>228</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>NOI</td>
<td>4.4135 a</td>
<td>341</td>
<td>0.8805</td>
</tr>
<tr>
<td>Non NOI</td>
<td>4.3982 a</td>
<td>221</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>NOI</td>
<td>4.4108 a</td>
<td>353</td>
<td>0.0378</td>
</tr>
<tr>
<td>Non NOI</td>
<td>4.2379 b</td>
<td>227</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>NOI</td>
<td>3.8457 a</td>
<td>337</td>
<td>0.1161</td>
</tr>
<tr>
<td>Non NOI</td>
<td>3.7018 a</td>
<td>218</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>NOI</td>
<td>4.9740 a</td>
<td>346</td>
<td>0.6516</td>
</tr>
<tr>
<td>Non NOI</td>
<td>5.0178 a</td>
<td>225</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Different letters for averages for a question indicate averages are significantly different at the α = 0.05 level.

Questions Referenced in Table G-3:
15. There is a monetary benefit in the added cost of diverting bulk chicken and potato commodities to manufacturers for further processing.
16. The added cost to further process bulk chicken and potato commodities prevents me from using this option.
17. USDA further processed commodities improve my ability to use commodities in my school district foodservice program.
18. Diverting bulk commodities to commercial manufacturers reduces labor costs in my school district foodservice program.
19. Diverting bulk commodities for further processing allows me to serve USDA commodities in a form that my students like.
20. Some food items with equal specifications can be purchased commercially less expensively than the commodity foods provided by USDA.
21.** Using net off invoice (NOI) that allows just-in-time delivery makes it easier for me to plan menus using commodity foods compared to other value pass through methods.
22. Nutrient content of a food product is important when making commodity purchase decisions.
23. Diverting bulk commodities to a manufacturer for further processing provides greater control of the nutrient content of the end product.
24. Nutrition is more important than cost when making a food purchase decision for Child Nutrition Programs.
25. I can divert bulk commodities to a manufacturer and receive a more nutrient dense end product than the further processed commodity foods offered by USDA.
26. Further processed, fully cooked forms of meat commodities reduce food safety concerns compared to bulk uncooked forms of commodity foods.
** Question 21 applies to those who use NOI and is only an assumption for those in non-NOI states. Question 21 lacks meaning for this comparison.

**What conclusions can be drawn from directors’ attitudes concerning nutrition?**

This research question corresponds to questionnaire items 22, 23, 24, 25, and 26. Confidence intervals were calculated for the average magnitude of each response, according to the following formula:

$$95\% \text{ Confidence Interval} = \bar{x} \pm t_{(n-1, \alpha = 0.05)} \sqrt{\frac{s^2}{n}}$$

Where $\bar{x}$ is the average magnitude of responses, $t_{(n-1, \alpha = 0.05)}$ is the critical value from a t-distribution, and $n$ is the sample size (number of respondents). Results are summarized as follows:

22. Nutrient content of a food product is important when making commodity purchase decisions. The average magnitude of response for this question was 5.25. A 95% confidence interval for this average is (5.18, 5.31).

23. Diverting bulk commodities to a manufacturer for further processing provides greater control of the nutrient content of the end product. The average magnitude of response for this question was 4.40. A 95% confidence interval for this average is (4.30, 4.50).

24. Nutrition is more important than cost when making a food purchase decision for Child Nutrition Programs. The average magnitude of response for this question was 4.35. A 95% confidence interval for this average is (4.27, 4.43).

25. I can divert bulk commodities to a manufacturer and receive a more nutrient dense end product than the further processed commodity foods offered by USDA. The average magnitude of response for this question was 3.79. A 95% confidence interval for this average is (3.70, 3.87).

26. Further processed, fully cooked forms of meat commodities reduce food safety concerns compared to bulk uncooked forms of commodity foods. The average magnitude of response for this question was 4.99. A 95% confidence interval for this average is (4.90, 5.08).

**Research Question 3: Is participation in NOI independent of use of ECOS?**

Research question 3 corresponds to questionnaire items 29, 38 and 39. Questionnaire item 38 was used to subset respondents who had the option to use ECOS. Results can be expressed as a contingency table (Table G-4).
Table G-4. Use of ECOS in NOI and Non-NOI states
(Only for respondents that indicated they had the option to use ECOS)

<table>
<thead>
<tr>
<th></th>
<th>Used ECOS</th>
<th>Did not use ECOS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOI</td>
<td>134</td>
<td>21</td>
<td>155</td>
</tr>
<tr>
<td>Non NOI</td>
<td>118</td>
<td>15</td>
<td>133</td>
</tr>
<tr>
<td>Total</td>
<td>252</td>
<td>36</td>
<td>288</td>
</tr>
</tbody>
</table>

The specific statistical hypothesis tested:

\[ H_0: p_{E \text{ NOI}} = p_{E \text{ non NOI}} \]
\[ H_A: p_{E \text{ NOI}} \neq p_{E \text{ non NOI}} \]

Where \( p_{E \text{ NOI}} \) is the proportion of responses from NOI states that used ECOS:
\[ p_{E \text{ NOI}} = \frac{134}{155} = 0.86, \]
and \( p_{E \text{ non NOI}} \) is the proportion of responses from non-NOI states with left over entitlement dollars:
\[ p_{E \text{ non NOI}} = \frac{118}{133} = 0.89. \]
The hypothesis was tested using a Chi-square test of independence. The resulting p-value is 0.56. Thus, the null hypothesis was not rejected. Thus, a significant difference could not be shown between ECOS use in NOI and non-NOI states.

**Research Question 4:** What department within the school district (foodservice or school district operations department) or state agency assumes responsibility for costs associated with using commodity foods such as storage and transportation of commodities?

This research question corresponds to questionnaire items 10, 11, and 12. Confidence intervals were calculated for the leading department in each question, according to the following formula:

\[
\text{95% Confidence Interval} = p \pm z_{\alpha = 0.05} \sqrt{\frac{p(1-p)}{n}}
\]

Where \( p \) is the proportion of the respondents indicating the department assuming responsibility for costs, \( z_{0.05} = 1.96 \), and \( n \) is the sample size (number of respondents).

Results are summarized as follows:

Storage and delivery costs associated with commodity foods: A 0.552 proportion of respondents suggest the foodservice budget pays this fee. A 95% confidence interval for this proportion is (0.535, 0.569).

Processing and administrative costs associated with commodity foods: A 0.642 proportion of respondents suggest the foodservice budget pays this fee. A 95% confidence interval for this proportion is (0.624, 0.659).
Costs associated with unused commodity foods: A 0.432 proportion of respondents suggest the foodservice budget pays this fee. A 95% confidence interval for this proportion is (0.412, 0.452).

Research Question 5: Is school district size correlated with CNP directors’ attitudes toward nutrition content of commodity foods?

Questionnaire items 15-26 measure directors’ attitudes toward the importance of nutrition, cost, and convenience of commodity foods; questionnaire item 31 measures the average daily participation for lunch. Responses were ordinal for items 15-26 (6 = strongly agree, 5 = agree, 4 = somewhat agree, 3 = somewhat disagree, 2 = disagree, and 1 = strongly disagree) and for item 31 (1 = 5,000 students or less, 2 = 5,000 to 9,999 students, etc.).

Pearson’s correlation coefficients were calculated between average daily participation responses and the different questions measuring attitudes. Each correlation coefficient was tested for significance, that is, the following statistical hypothesis test was conducted:

\[ H_0: \rho = 0 \]
\[ H_A: \rho \neq 0 \]

Where \( \rho \) is the correlation coefficient. Table G-5 summarizes the results.

Table G-5. Correlation between CNP Directors’ Attitudes Toward Commodity Cost and Nutrient Content (Survey Questions 15-26) and Average Daily Participation

<table>
<thead>
<tr>
<th>Question</th>
<th>Pearson's Correlation</th>
<th>p-value</th>
<th>sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>0.117*</td>
<td>0.0102</td>
<td>552</td>
</tr>
<tr>
<td>16</td>
<td>-0.109*</td>
<td>0.0138</td>
<td>554</td>
</tr>
<tr>
<td>17</td>
<td>0.071</td>
<td>0.1347</td>
<td>553</td>
</tr>
<tr>
<td>18</td>
<td>0.070</td>
<td>0.1307</td>
<td>552</td>
</tr>
<tr>
<td>19</td>
<td>0.060</td>
<td>0.2033</td>
<td>560</td>
</tr>
<tr>
<td>20</td>
<td>0.142*</td>
<td>0.0008</td>
<td>562</td>
</tr>
<tr>
<td>21</td>
<td>0.119*</td>
<td>0.0475</td>
<td>558</td>
</tr>
<tr>
<td>22</td>
<td>0.026</td>
<td>0.6636</td>
<td>573</td>
</tr>
<tr>
<td>23</td>
<td>0.081</td>
<td>0.0568</td>
<td>556</td>
</tr>
<tr>
<td>24</td>
<td>-0.104*</td>
<td>0.0078</td>
<td>572</td>
</tr>
<tr>
<td>25</td>
<td>0.057</td>
<td>0.2523</td>
<td>551</td>
</tr>
<tr>
<td>26</td>
<td>0.119*</td>
<td>0.0086</td>
<td>564</td>
</tr>
</tbody>
</table>

*Indicates correlations that were significantly different from zero.

Questionnaire items 15, 20, 21, 23, and 26 were found to be significantly positively correlated with average daily lunch participation (as the magnitude of one increased the magnitude of the other tended to increase). Questionnaire items 16 and 24 were found to be
significantly negatively correlated with average daily lunch participation (as the magnitude of one increased the magnitude of the other tended to decrease). However, none of the significant correlation coefficients exceeded a magnitude of 0.15 (suggesting a relatively weak correlation for all of the items with average daily lunch participation).

**Research Question 6:** Does the number of years a school foodservice director has been in the director position correlate to the perceptions of cost and nutrition content of commodity foods?

Questionnaire items 15-26 measure directors’ attitudes toward the importance of nutrition, cost, and convenience of commodity foods; questionnaire item 43 measures the years of service of the director. Responses were ordinal for items 15-26 (6 = strongly agree, 5 = agree, 4 = somewhat agree, 3 = somewhat disagree, 2 = disagree, and 1 = strongly disagree) and for item 43 (1 = less than 1 year, 2 = 1-5 years, etc.).

Kendall’s tau b correlations were calculated between the years of service of the director and attitude questions. Each correlation was tested for significance, that is, the following statistical hypothesis test was conducted:

H₀: ρ = 0
Hₐ: ρ ≠ 0

Where ρ is the correlation coefficient. Table G-6 summarizes the results.

<table>
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<tr>
<th>Question</th>
<th>Kendall’s tau b Correlation</th>
<th>p-value</th>
<th>sample size</th>
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<td>0.7902</td>
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<td>20</td>
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<td>0.183</td>
<td>566</td>
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<tr>
<td>21</td>
<td>0.026</td>
<td>0.2087</td>
<td>563</td>
</tr>
<tr>
<td>22</td>
<td>0.022</td>
<td>0.4595</td>
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<td>561</td>
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<td>578</td>
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<tr>
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<tr>
<td>26</td>
<td>0.019</td>
<td>0.4987</td>
<td>568</td>
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*Indicates a correlation that were significantly different from zero.
Questionnaire item 25 was found to be significantly negatively correlated with average daily lunch participation. However, its magnitude was modest at 0.88 (suggesting a relatively weak correlation).

**Research Question 7: Do SFNS Credentialed directors and non SFNS Credentialed directors have a different average number of years of service?**

Questionnaire items 42 and 43 measured SFNS credentialed status and directors’ years of service, respectively. Responses were ordinal for item 43 (1 = less than 1 year, 2 = 1-5 years, etc.). A t-test was used to compare years of service for SFNS membership and years of service for non SFNS membership. Specifically the following hypothesis was tested:

\[ H_0: \mu_{SFNS} = \mu_{non\,SFNS} \]
\[ H_A: \mu_{SFNS} \neq \mu_{non\,SFNS} \]

Where \( \mu_{SFNS} \) is the average response for SFNS credentialed directors and \( \mu_{non\,SFNS} \) is the average response for non SFNS credentialed directors. The results are summarized in Table G-7.

**Table G-7. Average Years of Service for SFNS Credentialed and non SFNS Credentialed CNP Directors**

<table>
<thead>
<tr>
<th>Credential Status</th>
<th>Average Response for Years of Service</th>
<th>Sample Size</th>
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<tbody>
<tr>
<td>SFNS Credentialed</td>
<td>3.69(^a)</td>
<td>117</td>
</tr>
<tr>
<td>Not SFNS Credentialed</td>
<td>3.26(^b)</td>
<td>454</td>
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</table>

\(^a^\) Different superscripts indicate a significant difference, p-value of 0.0005.

The data suggest SFNS credentialed directors had a significantly longer average time of service than non-credentialed directors.
The FREQ Procedure

Table of state_type by leftover_entit_money

<table>
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<th>leftover_entit_money</th>
<th>Frequency</th>
<th>Percent</th>
<th>Row Pct</th>
<th>Col Pct</th>
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</thead>
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<td>17.64</td>
<td>29.18</td>
<td>48.36</td>
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<td>42.81</td>
<td>70.82</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Statistics for Table of state_type by leftover_entit_money

- Chi-Square: 20.4925, Prob <.0001
- Likelihood Ratio Chi-Square: 20.3601, Prob <.0001
- Continuity Adj. Chi-Square: 19.7044, Prob <.0001
- Mantel-Haenszel Chi-Square: 20.4574, Prob <.0001
- Phi Coefficient: -0.1873
- Contingency Coefficient: 0.1841
- Cramer's V: -0.1873

Fisher's Exact Test

- Left-sided Pr <= F: 4.816E-06
- Right-sided Pr >= F: 1.0000
- Table Probability (P): 2.710E-06
- Two-sided Pr <= P: 7.125E-06

Sample Size = 584
The FREQ Procedure

Table of state_type by leftover_food_inventory

state_type leftover_food_inventory

Frequency, Percent;
Row Pct, Col Pct;

no yes Total

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<tr>
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Statistics for Table of state_type by leftover_food_inventory

Statistic DF Value Prob

Chi-Square 1 3.6293 0.0568
Likelihood Ratio Chi-Square 1 3.6934 0.0546
Mantel-Haenszel Chi-Square 1 3.6231 0.0570
Phi Coefficient 0.0789
Contingency Coefficient 0.0787
Cramer's V 0.0789

Pearson Chi-Square Test

Chi-Square 3.6293
DF 1
Asymptotic Pr > ChiSq 0.0568
Exact Pr >= ChiSq 0.0706

The FREQ Procedure

Statistics for Table of state_type by leftover_food_inventory

Fisher's Exact Test

Cell (1,1) Frequency (F) 91
Left-sided Pr <= F 0.9783
Right-sided Pr >= F 0.0348

Table Probability (P) 0.0130
Two-sided Pr <= P 0.0575

Sample Size = 583

The TTEST Procedure
### Statistics

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<th>Variable</th>
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<th>Upper CL Mean</th>
<th>Lower CL Std Dev</th>
<th>Upper CL Std Dev</th>
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<td>NOI</td>
<td>346</td>
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<td>NON-NOI</td>
<td>213</td>
<td>4.5676</td>
<td>4.8784</td>
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<td>NON-NOI</td>
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<td>1.0488</td>
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<td>-0.055</td>
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<tr>
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<td>NON-NOI</td>
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<td>1.0696</td>
<td>1.1317</td>
</tr>
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**Attitudes for NOI vs Non-NOI States**

**Attitudes Toward Nutrition Cost and Convenience**

08:53 Friday, October 13, 2006

**The TTEST Procedure**

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<th>Std Err</th>
<th>Minimum</th>
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Are NOI states independent of ECOS use?

The FREQ Procedure

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Statistics for Table of state_type by Q39Ans_IFQ38yes

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Sample Size = 288
### Correlation of School Size and Attitudes

08:53 Friday, October 13, 2006

The CORR Procedure

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### Correlation of Years of Foodservice and Attitudes

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<td>4.00000</td>
<td>1.00000</td>
<td>6.00000</td>
</tr>
<tr>
<td>Q24</td>
<td>556</td>
<td>3.79496</td>
<td>1.05063</td>
<td>4.00000</td>
<td>1.00000</td>
<td>6.00000</td>
</tr>
<tr>
<td>Q25</td>
<td>569</td>
<td>4.99473</td>
<td>1.12509</td>
<td>5.00000</td>
<td>1.00000</td>
<td>6.00000</td>
</tr>
<tr>
<td>Q43</td>
<td>590</td>
<td>3.36271</td>
<td>1.21422</td>
<td>5.00000</td>
<td>1.00000</td>
<td>8.00000</td>
</tr>
</tbody>
</table>

### Do SFNS Certified Directors have different average years of service?

08:53 Friday, October 13, 2006

The TTEST Procedure

Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>certification</th>
<th>N</th>
<th>Lower CL Mean</th>
<th>Upper CL Mean</th>
<th>Lower CL Std Dev</th>
<th>Upper CL Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>service_</td>
<td>NonSFNS</td>
<td>454</td>
<td>3.1448</td>
<td>3.2555</td>
<td>1.1267</td>
<td>1.2</td>
</tr>
<tr>
<td>service_</td>
<td>SFNS</td>
<td>117</td>
<td>3.4766</td>
<td>3.6923</td>
<td>1.0438</td>
<td>1.1778</td>
</tr>
<tr>
<td>service_</td>
<td>Diff (1-2)</td>
<td></td>
<td>-0.68</td>
<td>-0.437</td>
<td>-0.193</td>
<td>1.1299</td>
</tr>
</tbody>
</table>
### Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>certification</th>
<th>Upper CL</th>
<th>Std Dev</th>
<th>Std Err</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>service_</td>
<td>NonSFNS</td>
<td>1.2836</td>
<td>0.0563</td>
<td>0.0563</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>service_</td>
<td>SFNS</td>
<td>1.3516</td>
<td>0.1089</td>
<td>0.1089</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>service_</td>
<td>Diff (1-2)</td>
<td>1.2693</td>
<td>0.124</td>
<td>0.124</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

### T-Tests

| Variable  | Method       | Variances | DF   | t Value | Pr > |t| |
|-----------|--------------|-----------|------|---------|------|---|
| service_  | Pooled       | Equal     | 569  | -3.52   | 0.0005|
| service_  | Satterthwaite| Unequal   | 183  | -3.56   | 0.0005|

### Equality of Variances

<table>
<thead>
<tr>
<th>Variable</th>
<th>Method</th>
<th>Num DF</th>
<th>Den DF</th>
<th>F Value</th>
<th>Pr &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>service_</td>
<td>Folded F</td>
<td>453</td>
<td>116</td>
<td>1.04</td>
<td>0.8</td>
</tr>
</tbody>
</table>
APPENDIX H. INSTITUTIONAL REVIEW BOARD APPROVAL

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office of Research Assurances
Vice Provost for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515-294-4566
FAX 515 294-4267

Date: January 5, 2006
To: Barbara Jirka
From: IRB Co-Chair, Office of Research Assurances – Human Subjects
Re: IRB ID 05-598

The project “Commodity Processing Value Pass through Methods, Net Off Invoice, Fee for Service, Rebate” does not fit the definition of human subject research according to the federal guidelines, 45 CFR 46. Research is defined in 45 CFR 46 as a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge. Activities, which meet this definition, constitute research for purposes of this policy, whether or not they are conducted or supported under a program, which is considered research for other purposes. For example, some demonstration and service programs may include research activities. Because this project does not need IRB approval, you can proceed with the project. We do, however, urge you to protect the rights of your participants in the same ways that you would if IRB approval were required. This includes providing relevant information about the project to the participants.

Any modification of this project should be communicated to the IRB to determine if the project still meets the Federal definition of not being research. If it is determined that approval is needed, then an IRB proposal will need to be submitted and approved before proceeding with data collection.

C: Jeannie Sneed
AESHM
DATE: July 5, 2006

TO: Barbara Jirka
CC: Dr. Jeannie Sneed

FROM: Institutional Review Board
Office of Research Assurances

SUBJECT: IRB ID Number: 05-598

The Chair of the Institutional Review Board has reviewed the project “Commodity Processing Value Pass Through Methods, Net Off Invoice, Fee for Service, Rebate” and determined that the project does not meet the definition of human subject research according to the federal guidelines, 45 CFR 46.

Because this project does not need IRB approval, you can proceed with the project. We do, however, urge you to protect the rights of your participants in the same ways that you would if IRB approval were required. This includes providing relevant information about the project to the participants. Best practices would include in the e-mail recruitment message a statement of the voluntary nature of participation. However, this is up to your discretion.

Any modification of this project should be communicated to the IRB to determine if the project still meets the definition of not being research. If it is determined that approval is needed, then an IRB proposal will need to be submitted and approved before proceeding with data collection.
APPENDIX I. ADDITIONAL TABLE

Table 11. Reasons CNP Directors (N = 693) Reported That Their Districts Had Unused Entitlement Dollars or Commodity Food Inventory at the End of the School Year

<table>
<thead>
<tr>
<th>Reason</th>
<th>All Respondents&lt;sup&gt;a&lt;/sup&gt;</th>
<th>NOI States</th>
<th>Non–NOI States</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td><strong>Chicken</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. End of year delivery</td>
<td>241</td>
<td>60</td>
<td>106</td>
</tr>
<tr>
<td>B. Commodity delivered in form not usable in our program</td>
<td>11</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>C. Students do not eat the item</td>
<td>17</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>D. Inadequate quantity to serve all students</td>
<td>34</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>E. Usage did not match what was delivered</td>
<td>21</td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td>F. Not enough of this commodity offered</td>
<td>46</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>G. More commodity accepted than what could be utilized</td>
<td>93</td>
<td>23</td>
<td>49</td>
</tr>
<tr>
<td>H. Did not receive this commodity</td>
<td>26</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td><strong>Potatoes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. End of year delivery</td>
<td>110</td>
<td>43</td>
<td>47</td>
</tr>
<tr>
<td>B. Commodity delivered in form not usable in our program</td>
<td>4</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>C. Students do not eat the item</td>
<td>8</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>D. Inadequate quantity to serve all students</td>
<td>16</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>E. Usage did not match what was delivered</td>
<td>18</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>F. Not enough of this commodity offered</td>
<td>39</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>G. More commodity accepted than what could be utilized</td>
<td>33</td>
<td>13</td>
<td>19</td>
</tr>
<tr>
<td>H. Did not receive this commodity</td>
<td>55</td>
<td>22</td>
<td>34</td>
</tr>
</tbody>
</table>

<sup>a</sup>Respondents were asked to check all that apply, so totals will not add to 100%