

# THE IOWA HOMEMAKER

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## Acid Milk in Infant Feeding

By WINOGENE WUNDER

It is the general opinion of the public that neither orange nor lemon juice should be used with milk. Yet some form of acidulated milk has been in use for many years. Campert used acid milk in Holland in 1770. Ballot advocated its use in 1865. In 1902 De Mattos reported the use of buttermilk in Holland and increased usage in Germany with excellent results in difficult feeders and desperate cases of all kinds. In 1912, Brady of St. Louis used acid milk as a routine diet for sick and healthy infants in institutions. Finkelstein used acid milk with curds to make protein milk for treatment of diarrhea. Marriott, since 1919, has used acid milk and has been chiefly responsible for bringing it into general use. Sherman and Lohnes used it in 1920 and 1922, Shaw and Williams combined whole lactic acid milk with sugar and flour with good results. This historical background was taken from an article by Virginia T. Weeks.

The results have been noticeably better in the infants fed on lactic acid milk and corn syrup at the Washington University Dispensary than any other group artificially fed. Acid milk is now used in the feeding wards of practically all children's hospitals.

There are several different kinds of acid milk in use—lactic acid milk, hydrochloric acid milk, vinegar milk, and lemon juice milk. Lactic acid milk has been the longest in use in the form of buttermilk, so is the most popular. Marriott has done most of the recent sponsoring of lactic acid milk. Faber has used HCl acid milk, Dunham, vinegar milk, and Hess and Matzner favored the addition of lemon juice to milk. Lactic acid milk has the greatest acidity of the four, while next in order are vinegar milk, citric acid or lemon juice milk, and HCl acid milk with the lowest acidity.

Lactic acid milk seems to be the most popular of all the acid milks. "It is well tolerated, undiluted, in large amounts at an early age. It has a high caloric value, is concentrated and favors gastric as well as intestinal digestion. It is inimical to the pres-

ence and growth of pathogenic microorganisms."

Approximately 90 percent of the infants in the St. Louis Children's Hospital were fed on lactic acid milk in



In place of the controversial articles for the next few months we will run a series of articles on Foods and Nutrition. These articles will cover the various phases from infant feeding to adult feeding and will also take up some of the subjects of great importance in the diet.

1923. And in 1922 and 1923, 50 percent of the infants attending Washington University Dispensary were fed on acid milk formulae.

Whole cow's milk, artificially soured with lactic acid producing organisms, may be obtained from dairies in cities at about five cents more a quart than the usual pasteurized milk.

It may be prepared at home if one is not able to get it at a dairy. Cow's milk is sterilized, cooled and the scum removed. When cool lactic acid U. S. P. 75 to 85 percent is added by means of a medicine dropper; four c.c.'s of acid to each pint of milk. The day's feedings are made up at one time, and one ounce of Karo corn syrup for in-

ants up to two weeks is added for the entire day's feedings, and one and one-half ounces of syrup for older infants. When properly treated a smooth homogenous mixture results. About the

same amounts are taken as of other formulae—

1 week—2 oz.  
1 month—3 to 4 oz.  
4 months—6 oz.  
6 months—7 to 8 oz.

In feeding premature infants they are given one-half ounce skimmed lactic milk every two hours for 10 feedings a day. Most thriving premature infants soon take 2 to 8 oz. every three hours with seven feedings a day.

The formula may be altered to meet definite conditions by using skimmed milk or by decreasing the syrup used. But it is best to leave it as it is since dilution defeats the object aimed at.

The same formula is used for the entire year, the same as in the case of the natural diet. The infant, according to Marriott and Davidson, should be permitted to take all he desires. The behavior of the infant is the only test of the value.

In 1923, Hess and Matzner began to add fruit juices directly to the milk for a twofold purpose, to simplify the technique of feeding and to render the milk more acid. They first used tomato juice, adding one ounce to the quart, but without curdling. After this they used twice that amount. Gradually orange juice was used to replace the tomato juice. The anti-scorbutic vitamin was adequate, but the formula was insufficient in regard to acidity, except with the addition of larger amounts of the orange juice. The combination of food was well borne by the infant, but it failed to counteract sufficiently the buffer action of the protein and salts of the milk.

Determination of acidity was made with raw cow's milk, but when heated or pasteurized was found to give the same results. Also the pH of the orange and lemon juice was shown to be unchanged after boiling.

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you are thinking about it. Let's make Iowa Association news so interesting that more people will subscribe for the Journal just to read it!

Friends, this is your page, devoted to the interests of your State Association, whether you happen to be homemaker, teacher, member of a profession allied to homemaking or student club member. Isn't there some subject you would like to have discussed on the Association page? Do you have suggestions for making the page more worth while for all of us? Then sit down and write the editor of the page about it, won't you, before you forget it again.

### The New Home Economics Pins

This announcement has been received from our national office:

"American Home Economics Association and Student Club Pins, which the committee on seal and pin was authorized to provide, may now be purchased from the executive secretary, Miss Alice Edwards, 617 Mills Building, Washington, D. C. The same design is used on both—the Betty lamp in a circular borders similar to that used on the cover of the Journal. The pin for Association members is rolled gold with the words 'American Home Economics Association' in a band of dark blue enamel and sells for \$1.50. The one intended for the use of student clubs is in bronze with the lamp and lettering in good relief and sells for seventy-five cents."

Only members of Student Clubs affiliated with the American Home Economics Association and their advisors are entitled to wear the Student Club Pin.

Initials can be engraved on the back of the pin at an additional cost of five cents per letter. Two weeks will be required to fill orders where initials are to be engraved.

### Are You Making a Success of Your Job?

"The greatest success usually comes from following your natural bent", writes H. Adele Howe, head of Employers and Executives Exchange of Boston, in an article, "Finding Your Right Work in the Adult World" in The Christian Science Monitor. "You will accomplish the most for the common good and achieve the greatest happiness for yourself. You have been given talents to improve. Study yourself till you discover what they are. There is a right place for you. Study occupations till you find it. Determine your goal and see that you have the incentive to make you work for it.

"Then if you are governed by right motives nothing can prevent your success."

DEAN INGE:

"Gratitude is just as much a virtue which we are bound to practice as honesty or kindness."

### Begging Your Pardon

The "Installation Service For Student Clubs" published on this page in the November issue should have been credited to Miss Hazel McKibben of the Home Economics Education Department, Iowa State College, who wrote and used it in her student club while she was teaching in Oskaloosa High School. The service as presented by a group of Oskaloosa high school girls at the State meeting was under Miss McKibben's direction.

### Acid Milk in Infant Feeding

(Continued from page 1)

Twenty-five babies were given milk containing lemon juice and in no instance did a change from nonacidified milk lead to a refusal of the food or to digestive disturbances.

Many were fed milk mixtures containing lemon or orange juice for periods of 3 to 6 months without the occurrence of any signs or symptoms making it advisable to change the formula.

Faber preferred the addition of HCl acid to cow's milk because it is "the physiological acid and more suitable for enzyme action." There are, however, several disadvantages. It has a sour taste and a heavy flocculation of casein causes refusal by some infants. In 30 cases that he fed on HCl acid milk, he found that there was an increased tolerance to fat, and that the diarrhea cleared up rapidly.

He worked out two principles: 50 c.c. of 0.1 normal HCl acid to 100 c.c. of milk was rather sour and was often refused. He found that 25 c.c. of 0.1 normal HCl acid to 100 c.c. of milk gave satisfactory results.

Faber says that the transition to unsoured milk is more accurately accomplished with HCl acid soured milk, since the amount of HCl acid may be reduced slowly, and rapid reduction is not successful.

The advantages of vinegar milk in preference to other acid milk are that it is cheap, one cent per pint above the cost of milk, it is easily available and is a safe article for the kitchen. The milk is sterilized by boiling; vinegar, of 5 to 6 percent acetic acid, is added in the proportion of 1 to 15; Karo corn syrup in a 50 percent solution is added in proportion of one ounce to one pint of vinegar milk. The resulting acidity falls within the range of optimum digestion. The clinical results on 40 infants fed on this formula were said to be excellent.

### SUMMARY

1. Acid added to cow's milk decreases the buffer action of the milk.
2. Acid increases gastric activity, thereby bringing gastric activity within the range of peptic digestion.
3. Types of acid milk used—and clinical results:
  - a. HCl acid milk to date is the least popular.
  - b. Vinegar and lemon juice milk

both produce good results, but have not been extensively used.

c. Lemon juice milk has the advantage of containing antiscorbutic vitamin.

d. Lactic acid milk is preferred because its use is well established by successful clinical results over many years. It is readily prepared, cheap and can be tolerated by infants for a long period of time.

4. Presence of acid permits toleration of a liberal supply of fat.
5. Lactic acid milk is an excellent substitute for breast milk in infant feeding, since it is more easily digested by many infants than is sweet milk.
6. Infants on acid milk formula rarely develop diarrhea or vomiting.

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### A Noise that Annoys

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speech. Talking too loudly and too fast is further indication of our modern tendency to speed up and arrive with bells on.

Less noise and rattle and jar—more quiet and calm and the listening ear which separates peace from tumult! To so live and move that one may add not one drum's beat to the clamor and unrest about him. To so walk that he may serve instead in calming stormy waters. No richer gift could one ask!

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