

Animal Breeding

"Animal breeding has been a science only since the turn of the 20th century when Mendel's work was rediscovered," said Dr. W. A. Craft, recently in speaking on the subject "Systems of Animal Breeding" before the local chapter of the Junior Veterinary Medical Association. In spite of the fact that race preservation is one of the basic things in life, we have made little progress in its study, according to Dr. Craft, who is the present Director of the Federal Swine Breeding Laboratory on the Farm.

The systems of Breeding as outlined by Dr. Craft are:

- I. Within the Breed
 - a. Random Selection
 - b. Outbreeding
 - c. Inbreeding
 - Linebreeding
 - Moderate Inbreeding
 - Intense Inbreeding
 - d. Outcrossing
 - e. Grading
- II. Between Breeds
 - a. Cross-breeding
- III. Interspecific
 - a. Hybrids

In discussing the merits of the different systems, Dr. Craft gave a very fine comparison of the results and objectives of the several systems outlined above.

Random Breeding

Random selection is the most primitive system in operation. It serves merely as a means of reproduction and cannot be depended upon for progress in the development of breed ideals. Outbreeding is the commonest practice in vogue. It has contributed little to progressive breeding because of its slowness. We are indebted to Robert Bakewell for the pioneer work in inbreeding or the mating of related animals for the purpose of establishing superior breeds and types. Inbreeding is practiced in an attempt to fix the inheritance

of certain desirable qualities, and to make breeding results predictable in that respect. This fixation of inheritance is thought to be dependent upon the intensification of the blood lines or concentration of desirable factors without introducing outside blood lines which may cause the loss of the transmissibility of desirable traits. This theory of fixation of inheritance forms the basis and object of inbreeding plans.

In spite of its fine objectives, Dr. Craft warned that inbreeding may have several draw-backs. The foremost of these is the intensification of undesirable characters along with the fixation of the good ones. Many farms that have practiced inbreeding have complained of loss of vigor which minimizes the economic gain. Sterility and lack of breeding efficiency are also observations that have come from inbreeding establishments. Many defects are recessive and only crop out in offspring when both parents carry that tendency. Outcrossing is the mating of individuals of different strains or families but of the same breed. This is one of the most widely used systems. Grading has been and is still being used considerably. It consists in the usage of purebred sires to improve a mixed herd.

Cross Breeding

Cross-breeding is a practical scheme for the production of good market animals and is widely practiced by Iowa swine growers. Some breeders object strenuously to this method because they think it is destructive to breed standards. A further objection mentioned by Dr. Craft, is that purebreds of two different breeds must be used and there must be a reliable source from which to obtain them. Since new breeding stock must be obtained each year, this plan does not contribute anything to breed improvement. It has been thought that cross-breeds possess greater vigor than purebreds, but experimental work has shown that out-crossing will ef-

fect the same thing and allow the added advantage of raising only purebreds.

Narrow Limits

The limits of interspecific breeding are quite narrow with only the first generation being worthy of consideration. Most hybrids are sterile and have no value from the breeding standpoint. The hybrid that has achieved greatest prominence is the mule. The cattalo and the chicken-pheasant hybrids never amounted to anything.

Dr. Craft stated in conclusion, "We know little about the merits of any system, and actual breeding is the yardstick for the determination of genetic combinations. We cannot figure on paper or estimate in our own minds the outcome of different matings unless we resort to trial and error and keep records of our observations." He illustrated this point by say-

ing that champions bred to champions do not always produce champions. He feels that environmental influences may wreck the chances of a young animal even if it does have an aristocratic pedigree and a wealth of desirable genetic traits.

Hybrid Corn

Upon being questioned, Dr. Craft replied that Hybrid corn was an example of nicheing of two highly inbred strains. These have desirable characters to contribute, as well as undesirable ones, thus by proper manipulation the dominant or desirable features are allowed to overshadow the undesirable qualities. This great contribution to plant breeding is a stimulus and possibly an objective for animal breeding operations.

Cerebellar Agenesis in Kittens

A Case Report

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Early last fall I was called to observe two kittens about one month old, owned by Leonard Strand of Gowrie, Iowa. They were from a litter of three, the mother and litter mate being normal, short-haired and grey in color. These two had good coats of long, yellow persian hair and their general condition was good. However, they exhibited a peculiar incoordination when attempting to walk.

Their gate resembled somewhat that of a horse with string-halt and their sense of equilibrium was lacking to the extent that they fell over on their sides continuously, first on the right and then the left. They were able to reach a certain point only by traveling in a zig-zag fashion.

Another observation during the Christmas holidays revealed that there was no improvement in the condition and the owner consented to have one of the kittens taken to the Iowa State College Clinic.

Since this peculiarity seemed to be due to some embryological defect the kitten was destroyed and a post mortem examination was made.

Upon removal of the skull cap, we found a large, flabby cerebrum which extended back practically the entire length of the cranial cavity. The cerebellum was so far back that it did not have sufficient space in which to develop. It was so small that it could only be recognized by cross sectioning. The corpus quadrigemina was hypertrophied.

This condition has been reported in other animals but so far as we know has never been previously reported in the cat. Since the kittens with the same types of hair coats in this litter manifested the same symptoms it is logical to suppose that this condition might be due to color-linked genes.