

Fox Farming

A recent branch of animal production

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NO BRANCH of animal production has developed more rapidly in the past ten years than has the raising of fur-bearing animals. The profits derived from the sale of pelts as well as the prices paid for breeding animals have greatly stimulated interest in this field. But besides the money angle, the raising of fur-bearing animals is an extremely interesting occupation.

Fur farming is a direct outgrowth of early attempts of the Indians and trappers to hold over fur animals, captured out of season, until their pelts would be fully prime. The desire to dig fox pups out of their dens and raise them to maturity was due to the enormous prices which were commanded by black and silver fox skins. In the early days, the Hudson's Bay Company offered \$1,000 for a standard silver fox pelt. The efforts put forth by the Indians and trappers to obtain this almost unheard-of sum of money can be left to the imagination.

Early Breeders

Charles Dalton of Prince Edward Island, Canada, one of the first silver fox farmers, started his breeding operations with red foxes. He later purchased two pairs of silver foxes and abandoned the red breed. At about the same time, another Canadian named Oulton was carrying out a similar experiment. Later, in 1894, a partnership of these two men was formed. Dalton and Oulton kept their operations a secret until stories of their wealth leaked out. After this, a full-sized boom devel-

oped which lasted from 1910 to 1914. Breeding stock sold for as much as \$34,000 for a pair of foxes, with individual pelts bringing as much as \$2,700. However, the World War put an end to this boom and made farmers become more serious and consider quality instead of quantity.

In recent years, the speculative features of fox farming have almost vanished from the business. A good pair of silver fox breeders are now worth from \$600 to \$800. Enormous profits have vanished and a sound business has been established.

The Kjar Farm

On the Kjar Fur Farm there are over six hundred foxes of excellent quality. The ranch is constructed in a rectangular form surrounded by a guard fence which prevents the escape of foxes that might get out of their pens. Between each pen is a six-foot alley which prevents foxes of different pens from coming in contact with each other.

Each pen is 25 feet by 50 feet and contains one kennel. The kennel is divided into three parts. On each end is a winter home in which the female whelps. When one side gets dirty, the female fox carries her young to the clean side. This facilitates the sanitary problem considerably, as during this part of the year the foxes must not be disturbed. In the center of the kennel is the summer home. It consists of a large rectangular room with a partial wire bottom, so that the foxes can lie on it and keep cool. Ventilators are provided so that a steady flow of air is circulating through the room at all

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times. This type of kennel was originated on the Kjar farm and, because of its efficiency, has been copied by many other ranches.

The pens are constructed of galvanized wire. The walls are seven feet high with a two-foot overhand on top, which prevents the foxes from scaling the wall and crawling out. In the past, the pen ground was completely covered with wire in order to keep the foxes from digging out, but now this is prevented by cutting the digital tendons. This makes the foxes flat-footed but harms them in no way.

At the south end of our ranch is the feed house in which all food is prepared. It is constructed of tile walls with a cement floor so that sanitary measures are easily carried out.

Major Problems

In the raising of silver foxes, there are three important problems. These are feeding, breeding and sanitation. Each of these is equally important; failure in one negates even the most glowing success in the others. Correct feeding, breeding and sanitation are absolute essentials on the successful fox farm.

At the Kjar farm, definite balanced rations are always fed. Food is weighed to the ounce as foxes must be kept in perfect condition. If a fox is too fat, he becomes lazy and fails to breed, eat and grow the proper fur. If foxes become thin and hungry, they fight viciously and kill each other. If an unbalanced ration is fed, infectious and nutritional diseases occur which lead to an unprofitable business.

A specific feeding schedule is used during the breeding season, the whelping season, and again during puppy growth. A change in the schedule is always gradual. The following is an example of two different feeding schedules.

Food ration for the breeding season (Dec. 15 to March 1):

Meat	65%
Concentrate	10%
Ocean Whiting	6%
Figs	5%
Wheat Germ	5%

Liver	5%
Dehydrated Alfalfa Meal	3%
Milk Powder	1%

Total100%
Food ration for the whelping season (March 1 to July 1):

Meat	55%
Concentrate	11%
Tripe	10%
Ocean Whiting	6%
Figs	5%
Wheat Germ	5%
Liver	5%
Dehydrated Alfalfa Meal	1%
Milk Powder	2%

Total100%

The food is ground finely and thoroughly mixed, and is carefully weighed into individual portions and fed to the foxes in sterilized pans. In this way, the animals are provided with a clean, balanced ration. The foxes are fed once a day, at 5:30 p. m. Fresh water is kept in front of them at all times.

Breeding

One of the most difficult tasks of the fox farmer is that of breeding. Experience has taught us much, but the problem as to the best breeding system to use is very controversial. At the Kjar farm the system used is line-breeding, which consists of the mating of a fourth generation pup to its parents. By using this system it is possible to learn the record of a family and whether or not that family is profitable. A complete record of the foxes is kept by tattooing the record in the ears of each fox. If one were to mate the two best foxes on the ranch, without regard for their histories, results would be doubtful and records of no use. Without accurate records, the breeding schedule would be in a turmoil as inbreeding of all sorts would occur which would lead to low production and abnormal foxes. Therefore, one must know the definite characteristics of each family in order that he may judge whether or not a certain fox will have a high production rec-

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ord plus a desirable pelt, or if that fox will probably fall down in one of the desirable characteristics. Polygamous mating has recently come into practice with variable results. It is still in an experimental stage. At the Kjar farm nature's way of monogamous mating is still preferred; however, at present we are using both methods.

Breeding Season

Foxes must be kept very quiet during the breeding and whelping season, which extends from December 15 to June 15. During this time, only the caretakers are allowed inside the ranch. All excitement close to the ranch is removed. Any unusual disturbance may cause the female to kill her puppies. The oestrus, or heat period, occurs only once a year and lasts three to four days. The gestation period is 51 to 52 days. The young are born in March, April and May. The number of young varies from one to eleven, but the average litter is around four to six. The average production of all ranches throughout the country is around three. In twelve years of operation we have a ranch average of four plus.

Sanitation

Disease and parasitism are ever present to challenge the fox farmer. The Kjar Fur Farm has experienced no major outbreak of disease since 1937. But in order to control parasites and disease one must employ the most complete means of sanitation.

First of all, proper drainage is always important. Water puddles on the ranch are undesirable as they lead to parasitic infections and infestations that lead to the establishment of various infectious diseases as well as general unthriftiness.

Then, the general rules of sanitation should be followed. On the Kjar farm, sanitation is our watch-word. Water and feed pans are thoroughly washed and sterilized daily. Pens are cleaned every week, and kennels are cleaned and dis-

infected every week during the summer and fall. The feed house and equipment used to prepare the feed are thoroughly washed each day with water pressure. Weeds inside the pen are destroyed in the spring and kept close to the ground during the summer. To do this the use of sodium nitrate was first considered, but it was ruled out because of the danger of poisoning the foxes. The use of a large fire-gun was then tried. This proved quite successful but the flames were somewhat hard on the wire. The tremendous amount of heat given off burned green weeds in an instant and its application three times during the summer kept all weeds destroyed. It is possible the heat also aided in the destruction of parasites and bacteria present on the surface of the soil. Another method of weed control which seems to have certain advantages is now used. The foxes are shut in their kennels during the cool part of the day and sheep are let in their pens. In about two hours the sheep have completed their job.

Parasites

Up to now, internal parasites have caused very little trouble on the Kjar farm. Favorable climate and control measures have been effective in controlling these parasites.

Hookworms, lungworms and ascarids are the three most common parasites. Hookworms and ascarids can be controlled by sanitation. The few that are present can be eliminated by tetrachlorethylene capsules. Anthelmintics are seldom administered more than once a year unless the condition requires it more often. Lungworms have been a scourge on numerous ranches. When once established, they are hard to eliminate. Dry weather, which is prevalent in Nebraska, is fortunately not favorable for lungworms. But because there is no successful treatment for lungworms, preventive measures must be used, the most successful one known being sanitation. The lungworm egg is harmless for about three weeks after being eliminated in the feces before it becomes infective. Therefore, it is necessary to clean and disinfect the pens and kennels

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ture of this condition has been reported by Small²³.

Lethality

It is a fundamental fact of genetics that mutants with rather large somatic effects tend to be lethal. This would mean that the change in the developmental processes produced by the mutant gene is so great that the proper coordination and integration of the different processes during development are impaired. The action of the gene comes into effect very early in development so that a group of cells is affected that still has a rather unrestricted prospective potency, which would be segregated later in development. The effect of the gene controlled process therefore influences a large group of differentiating processes instead of only one in case of an effect at a later stage at which the cellular material is already subdivided as far as determination is concerned. The lethality of the homozygous effect is a consequence of the early action of the gene in destroying the anlage of prospective potency, which involves whole organ systems.

Mutant genes may be confined to definite periods of development. This means that the tissues are in a condition to react only at definite periods. It seems that these periods of susceptibility are those in which processes of determination take place. Lethal gene actions may also occur if some physiological process of vital importance is damaged or inhibited.

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at least every three weeks if the lung-worm is to be controlled.

Infectious Diseases

Of the infectious diseases, the most dreaded is encephalitis. This disease occurs in the fall when all the foxes to be pelted are put together in the run, a large pasture. In 1935, the Kjar Fur Farm witnessed an outbreak of epizootic encephalitis in the fox range where two hundred foxes were together. No advancing symptoms were seen. One morning eight foxes were found dead. The following morning, ten more were dead. When rounding up foxes, we would notice that some foxes, acting in a perfectly normal manner, would be running only to suddenly fall over and go into violent convulsions with death following within fifteen minutes. A similar outbreak occurred the following year. The disease is caused by a filterable virus and causes 15 to 20 per cent mortality in adult foxes and 80 per cent in fox pups. Because these outbreaks occurred at about the time of pelting, we were able to save the pelts of the dead foxes with little loss of price. During the summer of 1937 an autogenous bacterin was made up against the virus. Three treatments of this bacterin were given during the summer and fall. That fall our ranch was not the host of epizootic fox encephalitis, nor has it been since. Whether or not the bacterin should be given all of the credit is not known, but its use will be continued until it has been proved false.

As a summary pertaining to diseases, it is our belief that it is much easier to

prevent disease than to cure it. It is also less expensive. The strict practice of sanitation and use of prophylactic measures are recommended.

Incidentally, the use of an alarm system on a fox farm is of little value as the foxes have their own system. They have what is called an alarm call, which is a high, shrill, terrorizing call. They utter this call whenever they see or hear something that is out of the ordinary and frightens them. If one fox gives this call, all of the other foxes run for their kennels at once and do not come out for some time. This call would wake any caretaker and cause him to make a thorough search for the trouble.

One seldom notices a sick fox. Foxes are shy and hide when anybody approaches. Most ranches, therefore, have an observation tower from which the caretaker can watch the foxes without being observed. In this way, he is able to note any peculiar actions of the foxes which might indicate disease.

Pelting

Pelting is an important procedure, as much money can be lost in poor pelting operations. About October 1, the fox pelters are put in a big run consisting of a 52 foot by 75 foot dark building at one end of a three acre pasture. The run is enclosed by heavy wire walls with an underground floor extending four feet in, and a two-foot overhang at the top. When provided with this much space, foxes seldom try to get out. When put in the run, the foxes are not allowed to see the sun until pelted. They are kept in the large, dark building during the day and turned out into the run during the night. The lack of strong sunshine brings out a much clearer and brighter colored fur.

About December 15 the foxes are usually prime, depending on the weather. Pelting then starts and takes about two weeks with forty pelted each day. The fox is first killed with carbon monoxide gas and pelted immediately. The pelt is then fleshed and stretched with fur in and dried in a room kept at 60°F. When the pelt becomes dry, it is turned fur side out

and put back on the stretcher for further drying. After being completely dried, it is placed in a drum for cleaning. This involves the use of slightly moist sawdust. The pelt is then ready for shipment to market.

Pelts Are Shipped

All of our pelts are shipped to New York and put on general auction. They are purchased by the fur buyers who send them to their manufacturers. The fox fur is judged mainly on the quality, type, amount of and quality of silver, and size of the pelt.

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