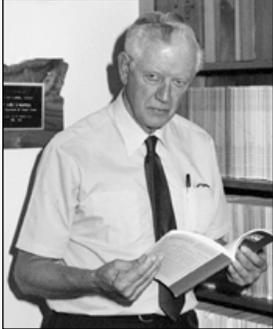


# FUR ANIMAL RESEARCH

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BY J.E. OLDFIELD  
CHRISTIAN FRENCH EDITOR



Spring is always an interesting time of the year. In the Northwest, the anticipated effects of El Niño have been realized to the extent that temperatures have been milder than usual and, as this is being written in mid-February, daffodils are already blooming in the garden. But the predictions were also that we could expect a drier winter than usual, with the heavy rains hitting the coast farther south in California. This part missed by a mile. As you may have read, or heard, southern California has had some real gully-washers recently, but there has apparently been more than enough moisture to go 'round, and we in the north have had one of the wettest winters on record. This suggests a couple of points to introduce this newsletter. Spring is, indeed, a time for renewal. It is a time when new crops are started, as in our mink breeding season, with all the anticipation and hopes for the future that it

brings. But it also overlaps the time of harvest, in the form of our fur sales, and these, like El Niño, can sometimes bring surprises. The word I am getting is that recent auctions have moved a lot of pelts, which is good, but haven't brought the hoped-for prices, which is disappointing. Many people nowadays look upon all types of farming as the "good life" – a way to escape the hectic hassles of city existence. They're right - it is a good life - but what is often not realized is that it has hassles of its own, often originating in situations over which we have little or no control, like the flooding rains of El Niño which have killed out new crop plantings in California's "breadbasket" valleys, and like market demands and prices in the case of our own fur industry. There are some things you can do to hedge your bets and improve your profit potential, however, and one of these is supporting your research program. Let me run past you some of the things it is working with this present year. Dr.

Aulerich and his group at Michigan State University are testing different methods of feed preservation and are continuing their outstanding work on feed toxins. The first is important because many of you have to buy feeds in large quantities that then have to be safely preserved until used. The second relates to both natural and accidental poisons that may find their way into your feeds and can wipe you out. Dr. Gorham at Washington State, cooperating with Dr. Bloom at Rocky Mountain Lab. and Dr. Durrant, in Utah, are leading the effort to control Aleutian Disease (AD), still one of the industry's major problems. Dr. Gorham's associates are also working on preventive measures against Tyrosinemia. Dr. Rose, at Idaho State University - considered a world authority on hormones and their actions - is testing alternatives to melatonin in accelerating winter priming. His work has the potential to save you significant money in feed costs, provided it can be applied

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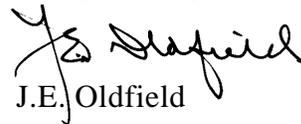
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without decreasing pelt quality, as Dr. Rose feels it can. Dr. Barnhart, at Utah State University, is examining possible immuno-stimulatory effects of melatonin. This work grew out of some Canadian rancher observations that melatonin-implanted mink were more resistant to both AD and distemper than non-implanted animals. Dr. Dyer, at North Dakota State University, the newest member of our team, is

testing types and sensitivities of E. coli bacteria from mink ranch operations. This work is timely because it relates to a growing problem in mink operations, as it does in other forms of animal production. Your Mink Farmers Research Foundation Board will be meeting in Pocatello, Idaho, the first weekend in April to discuss ongoing work and to make plans for the future. We will bring you research results

through this Newsletter and, as always, we invite your comments and suggestions. Write me, or any Board member: the addresses are at the back of this issue. We think we have a good and effective research program. It can be even better with your thoughtful input.

  
J.E. Oldfield

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## **THE G.R. HARTSOUGH SCHOLARSHIP AT MICHIGAN STATE**

Dr. Aulerich has kindly provided information on this year's recipient of the G.R. Hartsough Award, Marsha Morgan.

Marsha has a BS in Zoology/Pre-Medicine from Ohio University (1991) and an MS degree in Environmental Health from East Tennessee State (1994). At East Tennessee, she worked on hazardous and solid-waste management, with a thesis dealing with the teratogenic (deformity-causing) potential of atrazine and 2,4-D. She started on a doctor-

ate program in the Animal Science Department at Michigan State in 1995 and hopes to finish her research, in toxicology, with mink at the end of this year's fall semester. Dr.

Aulerich describes her as a "good student and productive researcher." Congratulations, Marsha; we look forward to seeing the results of your studies.



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## LACTATION: A CRITICAL PERIOD FOR MINK

The lactation period is generally believed to be the most critical stage, nutritionally, in the mink's life cycle. During this period, the female must maintain her own body weight and also provide, through milk production, for the extremely rapid growth of her kits. A recent study in Denmark provides some figures to assess just how high the nutritional requirements are for lactating females. The Danes showed

that lactating females lost about 15% of their body weight during the nursing period, and that most of this loss happened during the fifth and sixth weeks of lactation. Energy consumption, however, continued to increase, right through the lactation period. It was shown that the feed energy needed for milk production was so great that the females were in a negative energy balance during most of lactation, meaning that

the females had to draw on their own reserves to meet the needs for milk production. This reinforces our opinion that the females' diets must be not only adequate nutritionally, but also tasty and highly digestible during this critical time. (from Hansen, B.K. 1997. The lactating mink: Genetic and metabolic aspects. *Scientifur* 21(3):186-188.)

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## SIZE IS IMPORTANT THIS YEAR

A critical item in the mink business is assessing the market demand, or what buyers will pay for. Over the years, we've seen emphasis shift from animal size to fur quality and color. This year, auction reports identify size as the prime market demand - square inches of pelts marketed. There is a correlation between body weight and pelt size, so occasional checks on animal weights will help you achieve large pelts. We've reported before, and we remind you now, that Finnish studies

showed the difference between muscle growth and fattening, as far as pelt sizes are concerned. The normal growth pattern for mink is for peak body size to be reached in mid-September. After that, additional feeding causes the animals to fatten, rather than grow, and this doesn't have much of an effect on pelt size. The investigators restricted feed by 20% (fed them 80% of normal) after September 14 and compared them with full-fed controls. The control males gained 329 grams and females 227 grams

from then to pelting, as compared with 176 grams and 76 grams in the restricted males and females. The skins of the full-fed mink were not larger than those of the restricted animals at pelting, which reinforces the argument for backing off on feed a little after maximum growth has been reached. (from: Nurminen, L. and J. Sapponen, 1996. Effects of fattening on the skin length of farmed mink. University of Kuopio Dept. of Applied Zoology. Kuopio, Finland.)

## HOW MUCH IS ENOUGH?

I often get questions about fortifying mink diets with “super” amounts of minerals or vitamins. These are understandable, since these minor parts of the diet have been shown to have remarkable effects, and mink ranchers who care about their animals’ health and productivity naturally wonder whether “if a little is good, won’t more be better?” My answer is generally, “Probably not,” although there are some situations where extra vitamins have been shown to be helpful. Generally speaking, the requirements for minerals and vitamins have been calculated, and if they are supplied in adequate amounts to meet those requirements, adding more will not be useful and will just waste money.

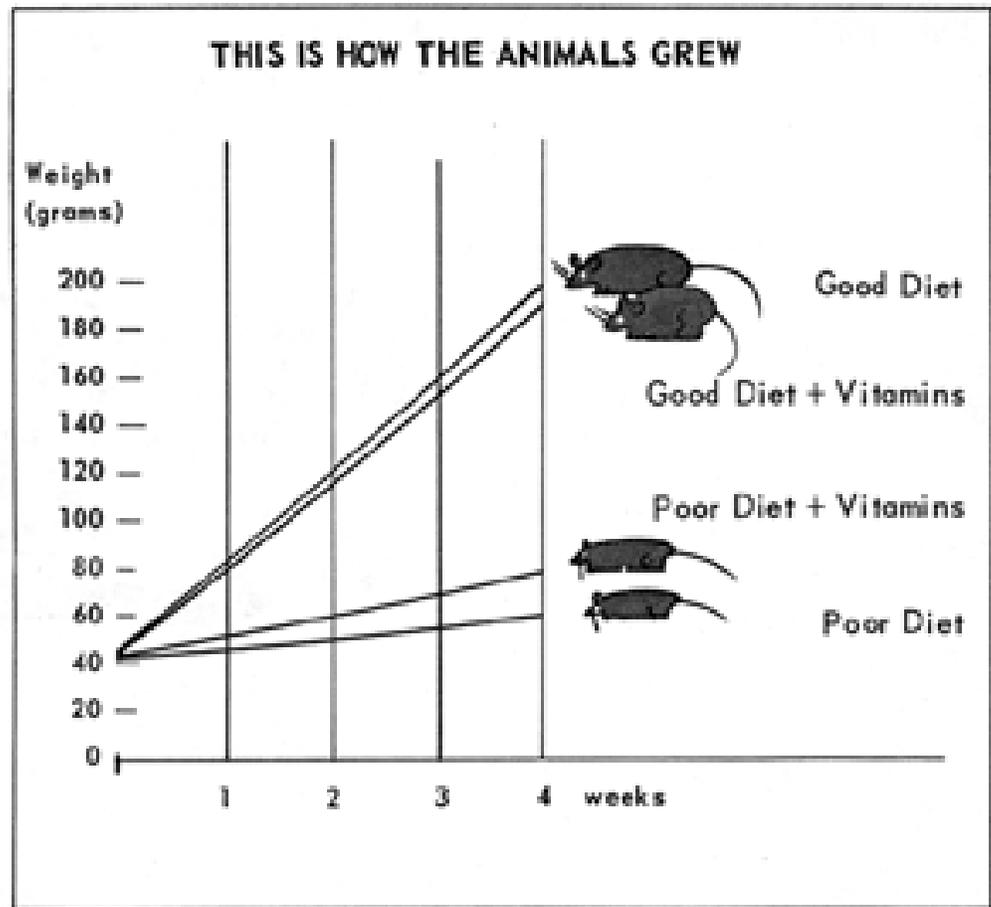
The fresh part of the mink diet – meat, poultry and fish and their by-products, and especially liver – are pretty good sources of minerals and vitamins and usually don’t need supplementation. This question has been around for awhile, and I found an interesting reference to it in an old publication from the Uni-

versity of California at Berkeley. There a group of students asked themselves the question, “Are extra vitamins needed on top of a good diet?” They set up two groups of rats and fed

jelly on unenriched French bread, butter or margarine, carrot sticks, vanilla wafers, soft drink.

Here’s what they found:

Note that while the addition of



one a “good” diet and the other a “poor” diet, supplementing both with the same supplementary vitamin mix. The diets were:

Good diet: Hamburger patty, cooked carrots, cole slaw, whole wheat bread, butter or margarine, milk.

Poor diet: Peanut butter and

vitamins improved growth on the poor diet, it had no effect on the good diet. (from: Ullrich, H.D. 1963. Are vitamin pills necessary? U. Cal. Agr. Ext. Service Pub. HXT-33, 4 pp.)

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## VIRUS ENTERITIS

Virus enteritis is caused by a parvovirus that is specific to mink and is related to the virus that causes a similar disease, panleucaemia, in cats. The virus is excreted in the mink's feces and urine, and this is how the disease is spread. The viruses are quite resistant to drying effects and may remain active in soil under cages for long periods of time. Losses are usually highest when the kits are young in the spring and protection is best achieved by

vaccination. Research on vaccines for virus enteritis is a continuing process and some interesting results have lately been reported from China. A mink enteritis virus was isolated from a naturally-infected, dead mink and was cultured in calf testis cells, in which the protective effect didn't show up until the 56th passage. An attenuated strain was produced which then was tested in mink challenged with mink enteritis virus on days 12, 60, 72 and

180 after inoculation. The protection rate for the vaccinated mink was complete (100%), as compared with 100% morbidity (sickness) and 40% mortalities in unvaccinated controls. In all, 59,940 mink were treated with this new vaccine, either orally or by injection, in northern China. (from: Tao, Q., et al., 1995. Chinese J. Vet. Sci. 15:130-134.)

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## MORE ON NURSING SICKNESS

Every year some female mink are lost to nursing sickness, usually about 4-6 weeks after they have given birth to their kits. Dehydration of the females accompanies this problem, and some years ago, Dr. Hartsough suggested adding salt to the diet as a means of encouraging higher water consumption. At the International Scientific Congress on Fur Animal Production in 1966, Danish investigators reported on experiments with salt supplementation of the diet. They worked with two groups of 115 female mink each and

treated them the same except that they approximately doubled the natural salt content of the control diet for their treated group. The two diets were fed from April 15 until two days after weaning. The group fed low salt had more kits per litter – usually a contributory cause of nursing sickness – and this was reflected in the number of cases that occurred: 22% in the low salt group vs. 7% (only about 1/3 as many) in the treated group. The investigators noted that the added salt made the diet more attractive to the

females, which helped keep them on feed during this critical period. Since salt cannot be stored in the body, it is necessary that it be provided in the daily diet. (I am indebted to Ron Gengel for this information, which came from: Clausen, T.N., S. Wamberg and O. Hansen. Effects of dietary salt supplementation on clinical and subclinical nursing sickness in lactating mink. In: Animal Production Review Appl. Sci. Rept. 28, pp. 87-91. 1996.)

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## FEED-WIRE MESH SIZES

Differences in feed source materials over time, and in their method of preparation (finer grinding), suggest that some changes in the grid size on feed-wire may be beneficial. This matter has been studied at the Danish Fur Breeders' station at Holstebro. They noted that as fish meals are being substituted for fresh fish products there is a tendency for

the feed mixes to become more crumbly and a smaller mesh might help prevent feed loss. They compared the usual feed grid with 1" x 1" mesh with a smaller, 1" x 3/4" one. The change to the smaller grid resulted in a saving of about 5-7% in feed during a one-month test. Part of the saving was probably due to reduced feed wastage but it wasn't possible

to calculate this exactly. There were no differences in growth rates between the two groups. The control group, on the old 1" x 1" mesh grid kept their feed areas cleaner than did the mink fed on the smaller grid. (from: Nielsen, U.L. 1996. Danish Fur Breeders Technical Year Report, 1996, pp. 233-236. Holstebro, Denmark.)

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## AVAILABILITY OF MEAT MEAL

Some things have happened this past year that suggest prices for meat meals may be coming down, perhaps making them a useful alternative for mink diet fortification. Last August, the Food and Drug Administration (FDA) issued a rule prohibiting feeding of animal protein meals to beef and dairy cattle. The intent of the rule was to prevent the occurrence of bovine spongiform encephalopathy (BSE), the so-called "mad cow

disease," in this country. BSE has not been diagnosed in the U.S. At the same time, the 1997 soybean crop was harvested and supplies of soybean meal, which is a competing protein source, increased and lowered its price. The third thing that happened was that railroad mergers (Southern Pacific and Union Pacific, for example), resulted in massive rail shipment delays, and meat meals originally intended for export remained in this country. All of

these happenings tended to increase the supplies and lower the prices for meat meals, which may then in some areas at least become attractively priced for use in mink diets. (from: CVM Update: a publication of the FDA's Center for Veterinary Medicine, January 22, 1998, and "The Animal Protein Collapse of 1997," in Render, the National magazine of Rendering, February, 1998, pp.12-15).

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## PHOSPHORIC ACID IN IN MINK NUTRITION

Phosphoric acid has been added to mink rations for over 40 years, both to aid in preservation of feed on the wire, and to prevent the formation of bladder stones in male mink. The usual

level of addition of phosphoric acid has been at 0.8% of the diet, using a feed grade product which is 75% actual phosphoric acid. This figures to be about 16 pounds per ton of mixed feed.

Reports of increased incidence of mink losses from urinary calculi have prompted investigation of the effects of higher levels of phosphoric acid addition. In tests where the acid

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## PHOSPHORIC ACID IN MINK NUTRITION (CONTINUED)

level was increased by one-quarter, to 1.0 of the total diet, there appeared to be advantages in terms of reduced incidence of urinary calculi, even in mink populations with a history of

bladder stone problems, and a reduction in the number of wet-belly pelts. (from: Leoschke, W.L., 1996. Phosphoric acid in modern mink and fox nutrition. In: Applied Science Reports 28,

Animal Production Review, VIth International Congress of Fur Animal Production. Warsaw, pp. 77-78.)

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## "PUSSY LUNG" IN MINK

Pleuritis, or "pussy lung," is a contributory cause of death in many mink affected with Aleutian Disease (AD). The affected mink may be found dead after missing only one or two days' feed, and are usually in good body condition. When necropsied, the chest cavity contains greyish-pink pus, hence the common name for the problem. In a study in Argentina, pleuritis accounted for slightly under 10% of 5,616 casualties recorded in a year.

All of the cases investigated tested positive to the CIEP test for AD, confirming that relationship which was first proposed by Dr. Gorham in 1984. The primary cause of this disease is still unknown, although a large and varied bacterial population can be found in the lung exudate. Two species, **Staph. aureus** and **Pasteurella multocida**, seemed to predominate and are present in large numbers in the exudates. Thirteen other

bacterial pathogens and three fungal species were also identified but their role in the progress of the disease was uncertain. (from: Martino, P.E. and J.J. Martino. 1996. Bacteriological culture and pleural fluid evaluation in mink. In: Applied Science Reports 28. Animal Production Review, VIth International Congress of Fur Animal Production, Warsaw. pp. 179-182.)

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## USE OF DIFFERENT MALES IN MATING

Some interesting studies with laboratory animals and with pigs have shown that it is possible to improve the level of reproductive performance by creating a sort of allergic reaction in the uterus prior to fertilization. Such a reaction can be caused by introducing killed or live semen into the uterus. Dr. Ulla Lund Nielsen looked at whether mink would

react the same way. She found, as many mink ranchers believe, that when a female is mated by two different males, rather than by the same male twice, that there was, indeed, a significantly better breeding result with mink. She points out that this increases the efficiency of male use and eases the work load during the busy breeding period, but that it has the

disadvantage of making the male parentage less certain which complicates breeder selection. (from: Nielsen, U.L. 199. Effect of mating with two different males on female mink reproduction. Technical Year Report for 1996, pp. 15-17, Danish Fur Breeders' Assoc., Holstebro, Denmark.)

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