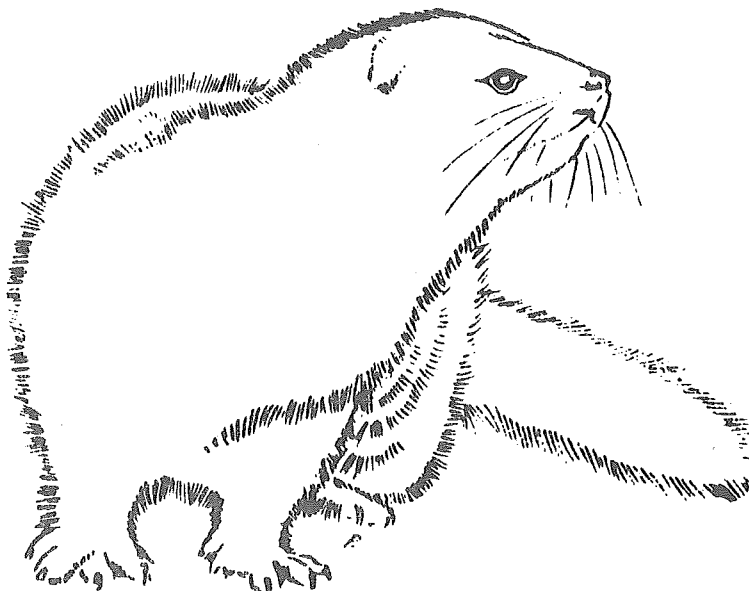


SCIENTIFUR
No. 4, November 1978.

Contents.

1. CONTENTS	1-3
2. NOTES.	4-5
3. <u>MULTIDISCIPLINARY.</u>	
THE INFLUENCE OF WHELPING ON GROWTH AND FINAL SIZE OF MINK. Boguslaw Barabasz, Stanislaw Jarosz.	6
ADVANCED WINTER FUR DEVELOPMENT IN MINK BY LIGHT REGULATION. Anders Skrede.	7
BODY SIZE AND SKIN SIZE OF DARK MINK. Jostein Reiten	8
SEASONAL CHANGES IN THE FUR OF FULLY GROWN CHIN-CHILLAS. Boguslaw Barabasz, Stanislaw Jarosz.	10
ASPECTS OF RACCOON (PROCYON LOTOR) SOCIAL ORGANIZATION. Erik K. Fritzell.	12
REPRODUCTION AND POST-NATAL DEVELOPMENT OF SOUTH AFRICAN MUSTELINES (CARNIVORA: MUSTELIDAE). D.T. Rowe-Rowe.	13
THE SMALL CARNIVORES OF NATAL. D.T. Rowe-Rowe.	14
VARIABLE HOME-RANGE SIZES OF FEMALE GRAY FOXES. Todd K. Fuller.	15
DISTRIBUTION, HABITAT UTILIZATION AND AGE STRUCTURE OF A SUBURBAN FOX (VULPES VULPES) POPULATION. Stephen Harris.	16
THE STOMACH CONTENTS OF FOXES, VULPES VULPES, COLLECTED IN NEW SOUTH WALES. J.D. Croft, L.J. Hone.	16



SCIENTIFUR
ISSN 0105-2403
Vol. 2, no. 4.
November 1978.

	ANAL SAC SECRETION OF THE RED FOX, VULPES VULPES; VOLATILE FATTY ACIDS AND DIAMINES: IMPLICATIONS FOR A FERMENTATION HYPOTHESIS OF CHEMICAL RECOGNITION. E.S. Albone, G.C. Perry.	17
	THE SUPRACAUDAL SCENT GLAND OF THE RED FOX, VULPES VULPES. Eric S. Albone, Peter F. Flood.	18
	WOOL GROWTH FACTORS AND THE BLOOD LEVEL OF GLUTATHIONE IN SHEEP. M.K.M. Ibrahim.	18
	HAIR CHEWING ASSOCIATED WITH SUSPECTED HYPERADRENO- CORTICISM IN A DOG. C.B. Chastain.	19
4.	<u>GENETICS.</u>	
	THE HERITABILITY OF THE NUMBER OF TEATS AND OCCURRENCE OF WHITE SPOTS IN STANDARD MINKS. J. Fiedler, R. Šiler.	20
5.	<u>REPRODUCTION.</u>	
	EARLY KIT LOSS RELATED TO THE NUMBER OF TEATS IN MINK FEMALES. Hans Pedersen.	21
	THE POSSIBILITY OF INCREASING LITTER SIZE IN MINK BY SELECTION. E.J. Einarsson.	29
	FINE STRUCTURE OF DEVELOPING SPERMATIDS USED AS A BASIS FOR STAGING OF THE SPERMATELEOSIS IN THE BLUE FOX (ALOPEX LAGOPUS). Kjell Andersen.	30
	FINE STRUCTURE OF SPERMATOGONIA AND SPERMATOCYTES IN THE BLUE FOX (ALOPEX LAGOPUS). Kjell Andersen.	31
	ATTEMPTS OF DETERMINATION OF CORRELATION BETWEEN SEXUAL REFLEXES, CHARACTERISTICS OF SEMEN AND FERTILITY IN MINK. Stanislaw Jarosz, Jerzy Slawoń, Jerzy Motz.	33
	ATTEMPTS AT PROVOKING AN OESTRUM AND OVULATION AT CHINCHILLAS (CHINCHILLA VELLIGERA) USING HORMONAL INJECTIONS. Stanislaw Jarosz.	34
6.	<u>NUTRITION.</u>	
	CHOLINE CHLORIDE IN THE TREATMENT OF FATTY LIVER IN MINK. Tapio Juokslahti, Paul Lindberg, Timo Pekkanen, Birger Sjögård.	35
	EFFECTS OF FEEDING RAW MEAT OR SOYBEAN MEAL ON BLOOD COMPOSITION IN MINK (MUSTELA VISON). P. Narasimhalu, R.J. Belzile, M. Lapage.	38
	THE USE OF KRILL SHRIMPS AS MINK FEED. Tuomo Kiiskinen, Jaakko Mäkelä, Outi Lohi.	39
	AN EXPERIMENT OF FEEDING RAW BARLEY AND OAT FOR MINK AND FOXES. Tuomo Kiiskinen, Jaakko Mäkelä, Outi Lohi.	41
	DIGESTIBILITY COEFFICIENT OF RATIONS USED IN THE NUTRITION OF COYPUS. Kazimierz Gacek.	42
	THE INFLUENCE OF THE AGE OF RABBITS ON THE DIGESTI- BILITY OF NUTRIENTS. Kazimierz Gacek.	42

7. VETERINARY.

PATHOGENESIS OF ALEUTIAN DISEASE OF MINK: IDENTIFICATION OF NONPERSISTENT INFECTIONS. Austin E. Larsen, David D. Porter. 44

ALEUTIAN DISEASE OF MINK: A PERSISTENT VIRAL INFECTION. David D. Porter, Austin E. Larsen. 44

REDUCED SEVERITY OF LESIONS IN MINK INFECTED TRANSPLACENTALLY WITH ALEUTIAN DISEASE VIRUS. David D. Porter, Austin E. Larsen, Helen G. Porter. 46

CHARACTERISTICS OF INAPPARENT ALEUTIAN DISEASE VIRUS INFECTION IN MINK. S.H. An, F.J. DePauli, P. Wright, D.G. Ingram. 46

LEAD POISONING OF RACCOONS IN CONNECTICUT. Richard W. Deters, Svend W. Nielsen. 47

AN EPIZOOTIC OF LISTERIOSIS IN CHINCHILLAS. G.G. Finley, J.R. Long. 48

THE CLINICAL EFFECTS OF CI 744 IN CHINCHILLAS, CHINCHILLA VILLIDERA (LANIGER). Terry A. Schulz, Murray E. Fowler. 49

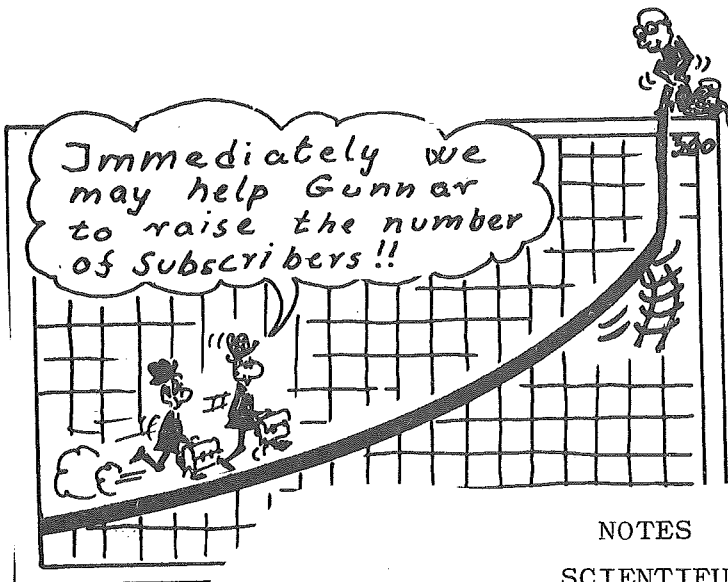
CASE REPORT: SELF MUTILATION IN AN ARCTIC FOX PUP (ALOPEX LAGOPUS). Daniel H. Nielsen. 50

POPULATIONS OF THE TICKS IXODES (PHOLEOIXODES) HEXAGONUS AND IXODES (PHOLEOIXODES) CANISUGA INFESTING SUBURBAN FOXES, VULPES VULPES. Stephen Harris, Gordon B. Thompson. 50

THE PREVALENCE OF SARCOCYSTIS SPP IN DOGS AND RED FOXES. J.N. Farmer, I.V. Herbert, M. Partridge, G.T. Edwards. 51

8. COMMUNICATION.

52-59.



NOTES
SCIENTIFUR

Vol. 2, no.4, November 1978.



Two years are gone. Our baby SCIENTIFUR has been bigger both in number of pages and in number of subscribers and contributors. Today we have 160 subscribers of the 300 suspected.

We hope that the baby will be growing a little bit faster in 1979 than in 1978. That is mainly up to you. Are you sure, that all possible people in your area know SCIENTIFUR? We would be glad to send a Christmas gift to the people, whose names and addresses we will get from you.

It have been a great pleasure during the year to hear all the kind words about SCIENTIFUR from colleagues in Canada, USA, England, Poland, Czechoslovakia, Germany, China and the Scandinavian countries. We are sure, that all of you hope SCIENTIFUR can survive, but we are in trouble because of the distance between the 300 subscribers expected and the actual number of 160. There are economical problems in the horizon and that is the reason for increasing the subscription rate from Dcr. 150,- per year to Dcr. 200,- per year.

We hope you will understand that and give us a back up when the bill is arriving in December. We also hope, that the payment will be done as far as possible, so we can use our time on productive work instead on administrative problems.

Under these conditions SCIENTIFUR will continue the next two years,

and we hope that we in common can stabilize the future of the journal.

One of the very good things is the still bigger stream of contributions to SCIENTIFUR, both as abstracts and as original articles. It is incontestable, that SCIENTIFUR has been a lot more actual during 1978. Thanks to you. Perhaps some of you from time to time think, that we are in the periphery of fur production, but we know, that the initiations to the scientists often are coming from the periphery. Also here it is mostly up to you what you want to read. We print what you send us in the hope, that our colleagues will be interested in reading it.

In SCIENTIFUR no. 1, 1978, we urged the leading institutions for fur bearers to make a survey of the extent of research etc. in their country. We are happy to present a paper from Bruce W. Smith, USA in this issue of SCIENTIFUR, and we thank you, Bruce, for the contribution.

The Second International Scientific Congress in Fur Animal Production is still an actual question in N.J.F.s fur animal division. Until today, we only have recieved 2 manifestations from our readers about the interest for participating the congress. It is important for the board to know whether there is an interest for such a congress or not. Therefore, on last page we are asking you for a written reaction as soon as possible by letter or by the printed formular on the same page.

In Denmark we held a successful meeting as adverticed in SCIENTIFUR no. 3, 1978. In this issue, two of the talks, given by Einar J. Einarsson and Anders Skrede, Norway, are referred. It is our hope, that we in the next issue will be able to bring abstracts of a lot of the very valuable reports given at this meeting.

Finally, we want to thank all subscribers and contributors for the co-work in 1978. We want to wish a Merry Christmas and a Happy New Year to all who reads these lines and we hope for a further progress for you and your SCIENTIFUR in 1979.

With kind regards


The editor

★ THE INFLUENCE OF WHELPING ON GROWTH AND FINAL SIZE
OF MINK.

(Terminy Wykotow a natężenie wzrostu i końcowa wielkość norek).

Boguslaw Barabasz, Stanislaw Jarosz, Instytut Zywienia Zwierzat i Gospodarki, Paszowej, Akademii Rolniczej w Krakowie, 30-059 Kraków, Al. Mickiewicza 24/28, Poland.

The experiment, which was carried out with uniform, well-planned nutrition, tested the growth of year old minks of the Standard/237/ and Platyn breed coming from three groups divided according to their whelping time/Standard: I: April 22nd - 29th, II: April 30th - May 3rd, III: May 4th - 12 th, Platyn: I: April 28th - May 1st, II: May 2nd - 5th, III: May 6th - 12th/ and litters of from 1 to 5 kits/sub-group A/and litters of more than 5 kits/sub-group B/. At weaning animals born at 1st term/Std: males from sub-group A - 815 g, from sub-group B 724 g, females from sub-group A - 534 g, from sub-group B - 484 g, Platyn: males from sub-group A - 684 g, from sub-group B - 484 g females from sub-group A - 532 g, from sub-group B - 484 g - they were considerably bigger than animals born at IIIrd term; Std: males from sub-group A - 660 g, from B - 675 g females from sub-group A - 463 g, from B - 450 g; Platyn: males from sub-group A - 577 g, from B - 541 g, females from sub-group A - 490 g, from B - 450 g/. At the time of kits intensive growth/July-August/absolute growth was highest for the animals of group III and those coming from litters of more than 5 kits; the Standard reached 19 g per day and the Platyn - 33 g. When the somatic growth was over, mink in all groups reached a similar final weight of statistically unimportant differences as a result of growth compensation. The sizes of the minks were as follows: Std: males from litters of 1 to 5 kits/sub-group A/: 1667 g, 1706 g, 1664 g, males from litters of more than 5 kits/sub-group B/: 1573 g, 1628 g, 1706 g, females, sub-group A: 965 g, 970 g, 984 g, sub-group B: 1400 g, 1356 g, 1319 g, females,

sub-group A: 875 g, 850 g, 842 g, sub-group B: 881 g, 858g, 886 g. No differences were found in the final quality of fur.

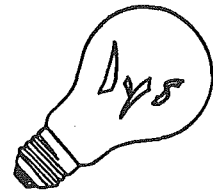
Institute of Animal Nutrition and Feeds.

Zootechnika Z. 18, 135, 1977.

7 references, 3 tables.

In Polish, English and Russian summary.

Authors abstract.



★ ADVANCED WINTER FUR DEVELOPMENT IN MINK BY LIGHT REGULATION

(Framskyndet vinterpelsutvikling hos mink ved hjelp av lysregulering).

By Anders Skrede

Department of Poultry and Fur Animal Science, Agricultural University of Norway, Ås-NLH, Norway

Studies have been conducted with mink throughout a 4-year period to study the effect of a 6-hour constant daylength from late June or early July to the time of primeness of the fur. The animals were housed in a lightproof building with manure cellar and adequate ventilation system. Light was provided by 60-watt incandescent bulbs connected to a time clock. Control animals received normal daylength at conventional farm conditions.

Shortened daylength and artificial light accelerated considerably the shedding of summer fur and the development of winter fur. Average pelting dates of animals which received normal light were Nov. 19 (kits) and Nov. 20 (adults). By comparison, the average light-controlled animals were pelted on Oct. 7 (kits) and Sept. 16, respectively. Thus, the pelting season was advanced with about 6 weeks for kits and 9 weeks for adults.

Light-controlled animals produced generally larger pelts than control animals, although the body weight at pelting was slightly reduced. The evaluation of fur quality revealed small and inconsistent differences between pelts of normal and light-controlled animals. There was, however, a tendency towards reduced hair length by light regulation of kits. The study further indicated that the light control of adults may be initiated somewhat earlier than that of kits. Unfavorable effects on the reproductive cycle may possibly be avoided by use of normal light from about Oct. 1 or earlier.

Advantages and disadvantages of light regulation were discussed. The system may save feed and labor, improve labor conditions, reduce the problem of frozen water, and permits early marketing of the pelts. The high initial investments seem to be the major drawback.

Paper presented at meeting in N.J.F.s Fur Animal Division, Elsinore, 9th-11th of October 1978, 15 pages.

6 tables, 2 figs., 13 references.

In Norwegian.

Authors abstract.

⊛ BODY SIZE AND SKIN SIZE OF DARK MINK.
(Kropps- og skinnstørrelse hos mørk mink).

Jostein Reiten, Agricultural University of Norway, Dept. of Poultry and Fur Animal Science, 1432 Ås-NLH, Norway.

The objectives of the present investigation were to shed light on the variations in size of dark mink and the relations between different measures of size of live animals and skins.

The investigation includes all kits of dark mink produced at the Agricultural University of Norway during the years 1970-1976, totally about 8,300 animals corresponding to about 6,350 skins.

Figure 1 shows the weight development of the mink kits each of the ►

years. The kits weighed at birth on the average 8-10 g, and at pelting the females weighed on the average just above 1 kg, the males almost 2 kg.

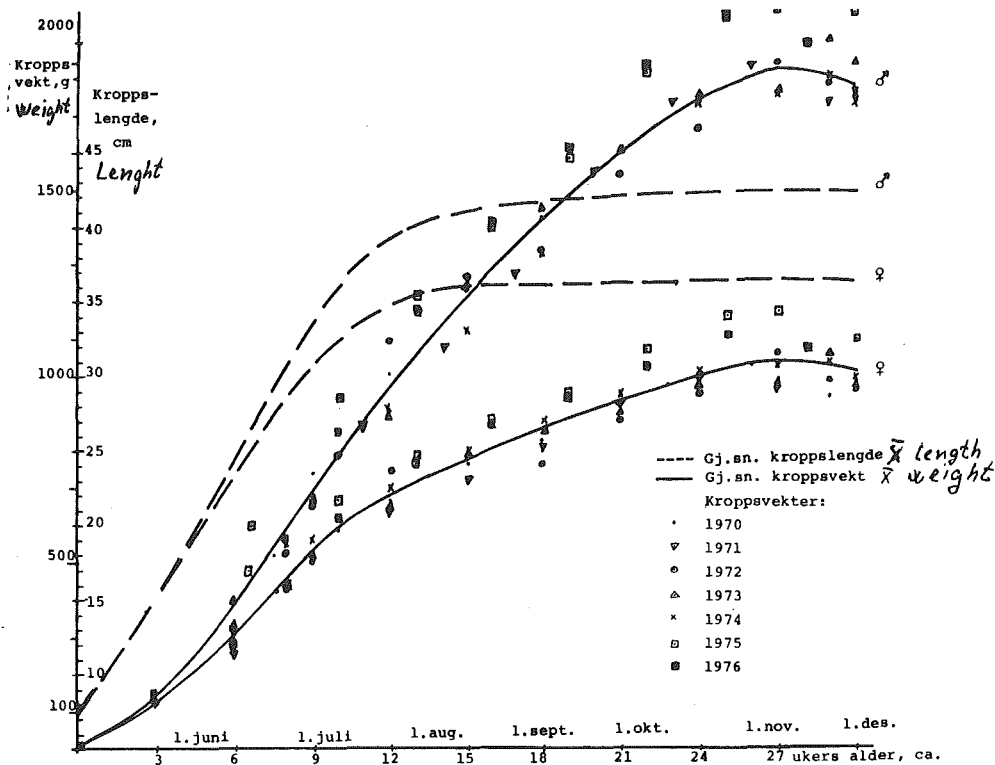


Fig. 1. The development of body weight in the years 1970-1976 and body length (from Rimeslått unpublished) for kits of dark mink. After Reiten, 1978.

The body length of the kit increases evenly till about midst of August when the length gain decreases strongly. Length growth seems to be completed the first year of life. The males were on average ca. 43 cm and the females ca. 37 cm long at pelting at the end of November. More than 85% of the females had a body length of 36-38 cm, and almost 80% of the males were from 42 to 45 cm.

Body weight of an animal generally increases with increasing body length. This investigation showed that on the average the males increased about 125 g and the females about 70 g for each cm increase in body length at pelting.

Maximum body weight of the mink during the autumn was the single characteristic that showed the highest correlation with skin length ►

($r\sigma = 0.87$, $r\phi = 0.76$), then followed body weight at pelting ($r\sigma = 0.85$, $r\phi = 0.75$) and body length ($r\sigma = 0.73$, $r\phi = 0.60$). For each hg extra weight of the animal at pelting the skin was almost 2 cm longer for males and 1 1/2 cm for females.

Multiple correlation showed that a model including body length as well as body weight at pelting explained 75-80% of the variation in skin length of males and 55-65% of females. At constant body length the skin length increased on average 1 cm in males and 1 1/4 cm in females for each hg extra body weight. At constant body weight the skin length was increased by 1/2-1 cm for each cm increase in body length.

A series of factors can influence the relation between different measures for size of live animals and skins. This report discusses some of these factors as for instance the effect of increasing stretch by boarding, early and late pelting and different age. It is also shown how the correlation between skin length and body weight increases with increasing age from birth on to pelting.

Scientific Reports of the Agricultural University of Norway,
ISSN 0025-8946, Vol. 57, 1978, no.3, 1-16.

9 tables, 6 figs., 12 references.

In Norwegian with English subtitles and abstract.

Authors abstract.

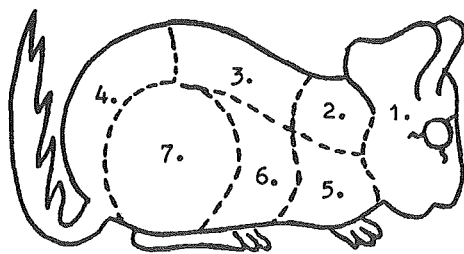
⊙ SEASONAL CHANGES IN THE FUR OF FULLY GROWN CHINCHILLAS.
(Sezonowe zmiany okrywy włosowej u szynszyli dorosłych)

Boguslaw Barabasz, Stanislaw Jarosz, Instytut Zywienia Zwierzat
i Gospodarki, Paszowej, Akademii Rolniczej w Krakowie,
30-059 Kraków, Al. Mickiewicza 24/28, Poland.

So far in Polish literature there has not been satisfactory explanation concerning the process of shedding chinchilla hair as well as specification of the best possible time for slaughter when fully

grown chinchillas hair is most fully developed.

On the experimental chinchilla farm of the Agricultural Academy in Kraków 24 grown up chinchilla were under observation concerning seasonal hair changes. The animals were kept in two pens unheated and heated during winter/from Oct. to March each year/. Other conditions such as feeding and maintenance were uniform. In two seasons of one year/I: from May 1971 to April 1972 and II: from October 1973 to September 1974/ on 7 chosen topographic parts of chinchilla's trunk and head, fur structure, density, uniformity, veiling and colour of the skin characteristic for phases at different times of fur growth were observed. The obtained results lead to the conclusion that the influence of climatic factors on the fur of chinchilla kept in pens is becoming less significant therefore the colour phases are not clearly marked. Chinchillas are usually winter prime from Nov. to Jan. depending on environmental factors. The influence of additional heating of a pen has no significant influence on fur growth. Summer prime pelts are very rare at present and may be observed only in the 2nd part of June in animals kept in unheated pens.



1. głowa - head
2. kark - neck
3. grzbiet - back
4. zad - rump
5. bark - shoulder
6. bok - side
7. biodro - hip

Ryc. 1. Wyznaczone do obserwacji strefy topograficzne ciała szynszyla

Fig. 1. Topographic parts of chinchilla under observation

After Barabasz and Jarosz, 1977.

Institute of Animal Nutrition Feeds.

Zootechnika A. 18, no.135, 1977, 93-107

1 table, 3 figs. 10 references.

In Polish with English and Russian summary and English subtitles.

Authors Abstract.

⊕ ASPECTS OF RACCOON (*PROCYON LOTOR*) SOCIAL ORGANIZATION.

Erik K. Fritzell, Dept. of Entomology, Fisheries, and Wildlife,
University of Minnesota, St. Paul, MN, USA 55101.

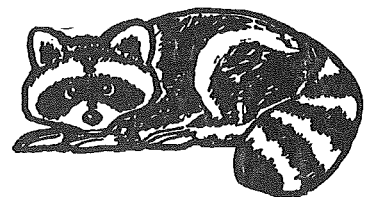
Spatial and temporal relationships among members of a raccoon (*Procyon lotor*) population were studied during spring and summer in east-central North Dakota during 1973-75. Radio telemetry was used to locate 48 raccoons 6443 times. Livetrapping results and other observations suggested that most raccoons in the area were radio equipped, densities were estimated to be 0.5-1.0 resident/km². Adult males, maintained large areas relatively exclusive of other adult males, they seldom were located within 3 km of each other even though their home ranges abutted. One adult male responded to the death of an adjacent adult male by shifting movements into the dead male's former home range. Two or more parous or pregnant females resided within the home ranges of a single adult male. All yearling males showed signs of dispersal in May, June or July, some occupied exclusive areas as adults in the following year. Parous or pregnant females (six adults, one yearling) occupied extensively overlapping home ranges, but were never located with other adult or yearling raccoons. Nulliparous yearling females did not disperse and tolerated other raccoons. Territoriality is indicated among adult males probably in response to competition for access to females.

Canadian Journal of Zoology, Vol. 56, 2, 1978, 260-271.

4 tables, 6 figs., 32 references.

In English with English and French summary.

Authors abstract.



★ REPRODUCTION AND POST-NATAL DEVELOPMENT OF SOUTH AFRICAN MUSTELINES (CARNIVORA: MUSTELIDAE).

D.T. Rowe-Rowe, Natal Parks Board, Pietermaritzburg, South Africa.

Information on the reproduction of South African mustelines is limited to brief comments in general handbooks, mainly on litter size, and speculation on the breeding season (Shortridge 1934, Ansell 1960a, Maberly 1963, Smithers 1965, Dorst & Dandelot 1970). As part of a project to study the behaviour and ecology of the mustelids of Natal, striped polecats (*Ictonyx striatus*) and African weasels (*Poecilogale albinucha*) were kept in captivity. Both species bred, and it was possible to make observations on reproductive behaviour and post-natal development of the young, details of which are reported in this paper.

Ictonyx striatus and *Poecilogale albinucha* were bred in captivity. Data indicate a breeding season which extends from the beginning of spring to the end of summer. In both species copulation was prolonged. A gestation period of 36 days was recorded for *Ictonyx* and 32 days for *Poecilogale*. Litter size was one to three of both mustelines. After 20 weeks the young of both species were almost fullgrown. Eyes opened at c. 40 days (*Ictonyx*) and c. 52 days (*Poecilogale*). Both species started to eat solids prior to this event. Three juvenile vocalizations were recognized in blind young, but thereafter adult sounds were made. The first successful rodent kills were made at nine and 13 weeks by *Ictonyx* and *Poecilogale* respectively, in litters left with their mothers as well as in animals reared in isolation. Play was mainly of an aggressive nature, involving actions typical of adult fighting, prey capture and killing. ▶



Zoologica Africana 13 (1), 104-114, 1978.

1 figure, 1 photo, 21 references.

Authors introduction and
abstract.

★ THE SMALL CARNIVORES OF NATAL.

D.T. Rowe-Rowe, Natal Parks Board, Pietermaritzburg, South Africa
3200.

THE LAMMERGEYER

NUMBER 25

MAY 1978

CONTENTS

The small carnivores of Natal, by D.T. Rowe-Rowe

CANIDAE

<i>Vulpes chama</i> (Cape fox)	5
<i>Canis adustus</i> (side-striped jackal)	6
<i>Canis mesomelas</i> (black-backed jackal)	7

MUSTELIDAE

<i>Aonyx capensis</i> (clawless otter)	11
<i>Lutra maculicollis</i> (spotted-necked otter)	13
<i>Mellivora capensis</i> (ratel)	15
<i>Ictonyx striatus</i> (striped polecat)	16
<i>Poecilogale albinucha</i> (African weasel)	18

VIVERRIDAE

<i>Viverra civetta</i> (civet)	21
<i>Genetta tigrina</i> (large-spotted genet)	21
<i>Paracynictis selousi</i> (Selous' mongoose)	24
<i>Cynictis penicillata</i> (yellow mongoose)	24
<i>Herpestes ichneumon</i> (Egyptian mongoose)	26
<i>H. pulverulentus</i> (Cape grey mongoose)	27
<i>H. sanguineus</i> (slender mongoose)	29
<i>Ichneumia albicauda</i> (white-tailed mongoose)	30
<i>Atilax paludinosus</i> (water mongoose)	32
<i>Mungos mungo</i> (banded mongoose)	35
<i>Helogale parvula</i> (dwarf mongoose)	36

PROTELIDAE

<i>Proteles cristatus</i> (aardwolf)	36
--	----

FELIDAE

<i>Felis caracal</i> (rooikat)	38
<i>F. lybica</i> (grey wild cat)	39
<i>F. serval</i> (serval)	41

SA ISSN 0075-7780

Information is provided on the distribution of 23 small carnivores of Natal, based on records collected between 1972 and 1977. For most of the species information is given also on general habits, ►

food, reproduction, and measurements. The status of each species is estimated, and relative abundance is assessed. An attempt is made to establish feeding strata, ten separate categories being recognised. Effects of small carnivore predation on small game, sportfish, and small domestic stock are discussed.

The Lammergeyer 25, May 1978, 1-48.

27 tables, 26 figs., 39 references.

Authors abstract.

★ VARIABLE HOME-RANGE SIZES OF FEMALE GRAY FOXES.

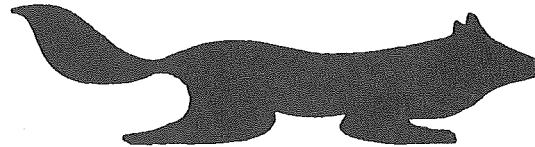
Todd K. Fuller, Division of Wildlife and Fisheries Biology,
Univ. of California, Davis, California 95616 (present address:
Dept. of Wildlife Ecology, University of Wisconsin, Madison,
Wisconsin 53706).

Four female gray foxes (Urocyon cinereoargenteus) were radiotracked in an experimental agricultural area in the Central Valley of California between January and July 1975 to determine home range sizes and habitat use. Six-fold differences in home range size were correlated with varying quantities of 5 available habitat types, range size also decreased as habitat quality increased.

Journ. of Mammalogy, Vol. 59, no.2, 446-449, 1978.

2 tables, 7 references.

Authors abstract.



★ DISTRIBUTION, HABITAT UTILIZATION AND AGE STRUCTURE OF A
SUBURBAN FOX (*VULPES VULPES*) POPULATION.

Stephen Harris, Dept. of Zoology, Royal Holloway College, Egham,
Surrey, England.

The occurrence of wild foxes in suburbia is discussed. It is shown that in London breeding populations of foxes are found 5 km from the city centre, and in the last 3 years foxes have been recorded in the very centre of the city.

The fox population in London is shown to be heavily dependent on residential habitats for both daytime harbourage and when selecting sites for natal earths. The fox population is unevenly distributed in London, with a marked clumping of the adult population during most of the year.

The age structure of the population is presented, and these data are compared with data from other canid populations. Conclusions are drawn as to the effects of conventional control techniques on the age structure of a fox population.

Mammal Rev. 1977, Vol. 7, no.1, 25-39.

9 tables, 2 figs. 49 references.

Authors abstract.

★ THE STOMACH CONTENTS OF FOXES, *VULPES VULPES*, COLLECTED
IN NEW SOUTH WALES.

J.D. Croft, L.J. Hone, New South Wales Dept. of Agric., Noxious and
Feral Animals Res. Section, Vet. Res. Stn., Glenfield,
N.S.W. 2167.

Present address: Agric. Res. Station, Cowra, N.S.W. 2794,
England.

Stomach contents were examined from 899 adult foxes collected during ►

1969-73 from all parts of New South Wales. Food items were found in 811 (90.2%) stomachs. The fox appeared to be mainly carnivorous though there was a wide dietary range. The major food items in terms of percentage volume were rabbit, sheep and house mouse. The incidence of plant material and insects was relatively high, but was low in terms of volume. The occurrence and volume of some of the different food items varied between seasons, years and regions of the State.

The occurrence and relative importance of the different food items are discussed.

Aust. Wildl. Res., 1978, 5, 85-92.

3 tables, 2 figs., 13 references.

Authors abstract.

⊕ ANAL SAC SECRETION OF THE RED FOX, *VULPES VULPES*; VOLATILE FATTY ACIDS AND DIAMINES: IMPLICATIONS FOR A FERMENTATION HYPOTHESIS OF CHEMICAL RECOGNITION.

E.S. Albone, G.C. Perry, Dept. of Animal Husbandry, Univ. of Bristol, Langford, Bristol, BS18 7DU, U.K.

Putrescine (1,4-diaminobutane) and cadaverine (1,5-diaminopentane) were identified in the anal sac secretions of the red fox, *Vulpes vulpes*, and of the lion, *Panthera leo*. Anal sac secretion samples obtained over a period of 10 weeks by sampling from within each sac of each of 6 captive foxes were analyzed and putrescine, cadaverine, and volatile fatty acid compositions and secretion pH values recorded. A significant ($P < 0.001$) negative correlation of pH (range 6.5-9.4) with total volatile fatty acid concentration was observed. Secretion compositions are discussed in the context of a fermentation hypothesis of chemical recognition. Secretion samples could not be unambiguously assigned to particular foxes on the basis of simple comparisons of volatile fatty acid profiles ►

alone. Composition differences were noted between secretions obtained at a given time from corresponding right and left sacs.

J. Chem. Ecol., 1976, Vol. 2, no.1, 101-111.
2 tables, 1 fig., 20 references.

Authors abstract.

★ THE SUPRACAUDAL SCENT GLAND OF THE RED FOX, VULPES VULPES.

Eric S. Albone, Peter F. Flood, Dept. of Animal Husbandry,
Univ. of Bristol, Langford, Bristol BS18 7DU, U.K.

The supracaudal gland of the red fox consists of both tubular "apocrine" sweat glands and massively developed sebaceous glands. The gland is characterized by a high level of histochemically demonstrable hydroxysteroid dehydrogenase activity (particularly β -3 β HSD) and by the presence of naturally fluorescent photolabile sebum constituents. Evidence suggests that these components may be carotenoid. Results are presented in the context of histological observations and are discussed in relation to scent production.

J. Chem. Ecol. 1976, Vol. 2, no.2, 167-175.
1 table, 2 figs., 25 references.

Authors abstract.

★ WOOL GROWTH FACTORS AND THE BLOOD LEVEL OF GLUTATHIONE IN SHEEP.

M.K.M. Ibrahim, Animal Prod. Dept., Fac. of Agricultural Science,
Helwan University, Moshtohor - Kalubia/AR Egypt.

Starting from the positive correlation between the content of glutathione in the blood and the wool growth the influence was investigated of the genetic construction (local breed with coarse wool (I), Pakistan breed with semi-fine wool (2), and the F1 of

female (1) x male (2) animals), of sex, age (6 or 13 months respectively), and of shearing status (shortly before shearing and 4 weeks after shearing). In all genetic constructions the male, older and shorn animals had a significantly higher ($\alpha < 0.05$) blood level of glutathione. As compared to the initial breed, the glutathione content in the blood of the F1 animals was significantly higher.

Landwirtsch. Veterinärmedizin, 15, 4, 1977.

1 table, 17 references.

In English with abstracts in German, Russian, French and Spanish.

Authors abstract.



⊛ HAIR CHEWING ASSOCIATED WITH SUSPECTED HYPERADRENOCORTICISM
IN A DOG.

C.B. Chastain, Dept. of Vet. Clin. Sciences, Coll. of Vet. Med.,
Iowa State University, Ames, IA 50010, USA.

Hyperadrenocorticism (Cushing's-like syndrome) is well documented in dogs. In man, neurosis and even psychoses often occur in association with hyperadrenocorticism. Confusion, illusions, hallucinations, and amnesic symptoms are some of the manifestations reported. The only neurologic abnormalities recognized in dogs with hyperadrenocorticism have been secondary to enlarging ACTH-secreting pituitary neoplasms.

The purpose of this report is to describe hair chewing in a dog with suspected hyperadrenocorticism and the dog's response to an adrenocorticolytic drug.

Hair chewing in a 14-year-old female Toy Poodle was associated with signs of hyperadrenocorticism. Complete remission of both the psychosis and signs of hyperadrenocorticism followed mitotane therapy. J. Amer. Vet. Med. Ass., Vol. 172, 5, 573-574, 1978.
3 photos, 16 references.

Authors introduction and abstract.

④ THE HERITABILITY OF THE NUMBER OF TEATS AND OCCURRENCE OF WHITE SPOTS IN STANDARD MINKS.

(Děvivost počtu struků a výskytu bílých odznaků u standardních norků).

J. Fiedler, R. Šiler, Výzkumný ústav živočišné výroby, 251 61 Praha 10 - Uhřetěves, Czechoslovakia.

In the population of standard minks from the farm of the Research Institute of Animal Production at Uhřetěves, the heritability coefficient $h^2 = 0.53 \pm 0.223$ was estimated for the number of teats by means of the analysis of variance in 343 young at the age of 20 days. The young were progenies of 39 male and 77 female minks. The coefficient of heritability $h^2 = 0.71 \pm 0.280$ for the number of white spots was estimated by means of the analysis of variance in 293 young at the age of 50 days after 37 male and 68 female minks. A highly significant correlation coefficient ($r = 0.71 \pm 0.110$) was found between the number of functional teats of the mother and the number of young per litter at the age of 20 days.

Živočišná Výroba, 22 (L), 1977, 9, 705-710.

3 tables, 19 references.

In Czechoslovakian with English subtitles and abstracts in English, Russian and German

Authors abstract.



ORIGINAL PAPER.

★ EARLY KIT LOSS RELATED TO THE NUMBER OF TEATS IN MINK FEMALES.

Summary of a graduate project made at the Natl. Inst. of Animal Science, Dept. of fur bearing animals.

Hans Pedersen, Danish Fur Breeders Association, 60 Langagervej, DK 2600 Glostrup, Denmark.

In mink farming there is a very high mortality among the kits in the first 3-4 days after birth. By reducing this mortality, the litter size can be increased and a better economy will be the end result.

Investigations (Mohr 1969, Hoogenbrugge & Baud 1975) have shown a connection between the total number of teats at the females, the number of functional teats and the number of born kits and the mortality.

Table 1. Distribution of females in relation to their number of teats.

Number of teats	Teats total				Teats active			
	Mohr		Hoogenbrugge		Mohr		Hoogenbrugge	
	1967	1969	1972	1973	1967	1969	1972	1973
0	-	-	-	-	1.3	7.5	-	-
1	-	-	-	-	0.5	-	0.5	-
2	-	-	-	-	0.7	1.9	2.7	-
3	-	-	0.5	-	1.1	0.9	1.6	0.5
4	0.7	-	-	-	3.1	8.2	5.5	1.1
5	0.9	0.5	-	-	7.5	7.9	9.9	3.3
6	25.0	19.6	9.3	14.2	30.1	26.6	33.5	19.7
7	30.5	27.5	30.8	24.0	28.1	20.5	29.1	31.7
8	37.8	41.5	39.6	14.0	25.0	21.7	13.7	38.2
9	4.0	9.1	16.5	17.5	2.4	4.0	3.3	10.9
10	1.1	1.9	3.3	3.3	0.2	0.9	-	-
\bar{x}	7.2		7.7	7.7	6.6		6.2	7.2

Mohr 1969 compared the breeding results for the two years to the numbers of functional teats.

From table 2 it appears, that an increase of the litter size will cause an increase in the number of functional teats. In addition, increasing of the number of functional teats will decrease the kit mortality in the first few days after birth.

Table 2. Breeding results in relation to the numbers of function teats.

Number of active teats	Number of kits per litter					
	total at birth		born alive		alive at 3th day	
	1967	1969	1967	1969	1967	1969
0	4.1	2.3	3.9	1.4	0.2	0.3
1	4.0	-	4.0	-	0.5	-
2	4.0	4.6	4.0	3.5	2.3	2.0
3	7.0	2.5	5.6	2.5	3.6	2.0
4	4.0	3.9	3.4	3.5	2.5	2.8
5	4.5	4.7	4.3	4.4	3.8	4.0
6	5.4	4.9	5.0	4.6	4.5	4.2
7	5.4	5.4	4.9	5.2	4.6	4.8
8	5.4	5.4	5.1	5.1	4.7	4.6
9	5.5	5.1	5.4	4.8	5.3	4.4
10	6.0	6.5	6.0	6.1	6.0	6.0

Material and methods.

The investigation included 120 standard females and their kits.

All the nests were examined and the kits counted at the 1st, 3th and 7th day after birth. At the 3th day after birth the number of teats at the females were counted. The activity of the teats were examined by pressing at the teat.

By all the examinations, the dead kits were collected. The lungs ►

were removed and placed in water at all dead kits collected at the 1st day after birth. It was done for examining how far the mortality was prenatal or postnatal. General all dead kits found at the 1st day after birth, is said to be dead prenatal.

All collected dead kits were opened into the abdomen, and the ventricle was examined for content of milk.


There were a variation in the colour of the instestine vary from very light to dark. It was graded subjectively.

Results and discussion.

The total number of teats were found to be 6.7 (SD=1.3) in average, and the number of functioning teats were 5.7 (SD=1.8) in average. By dividing up the females into two groups, one for first year females and one for older females, the total number of teats were 6.3 (SD=1.6) and 6.8 (SD=1.1), respectively. The number of functioning teats were 4.9 (SD=2.2) and 5.9 (SD=1.6) for the two age groups.

By comparing the total number of teats in the two groups, it should not be expected to find any difference, because there have not been any direct selection. However, there was such a difference ($P < .05$). This difference indicate, that when selecting for an increase in number of kits at weaning, there also is an indirect selection for an increase in number of teats.

By comparing the total number of teats and the number of functioning teats as shown in fig. 1, the relation between the two factors is seen to be best in the old females group.

Moreover fig. 1 shows that, if a female only have a few teats, mostly at first year females, there is a risk that the teats do not function. Moreover the figure shows, that a female ought to have 7 teats as a minimum, which is the same as 6 functioning teats. This have to be a minimum demand, because every kit ought to have a functioning teat. 

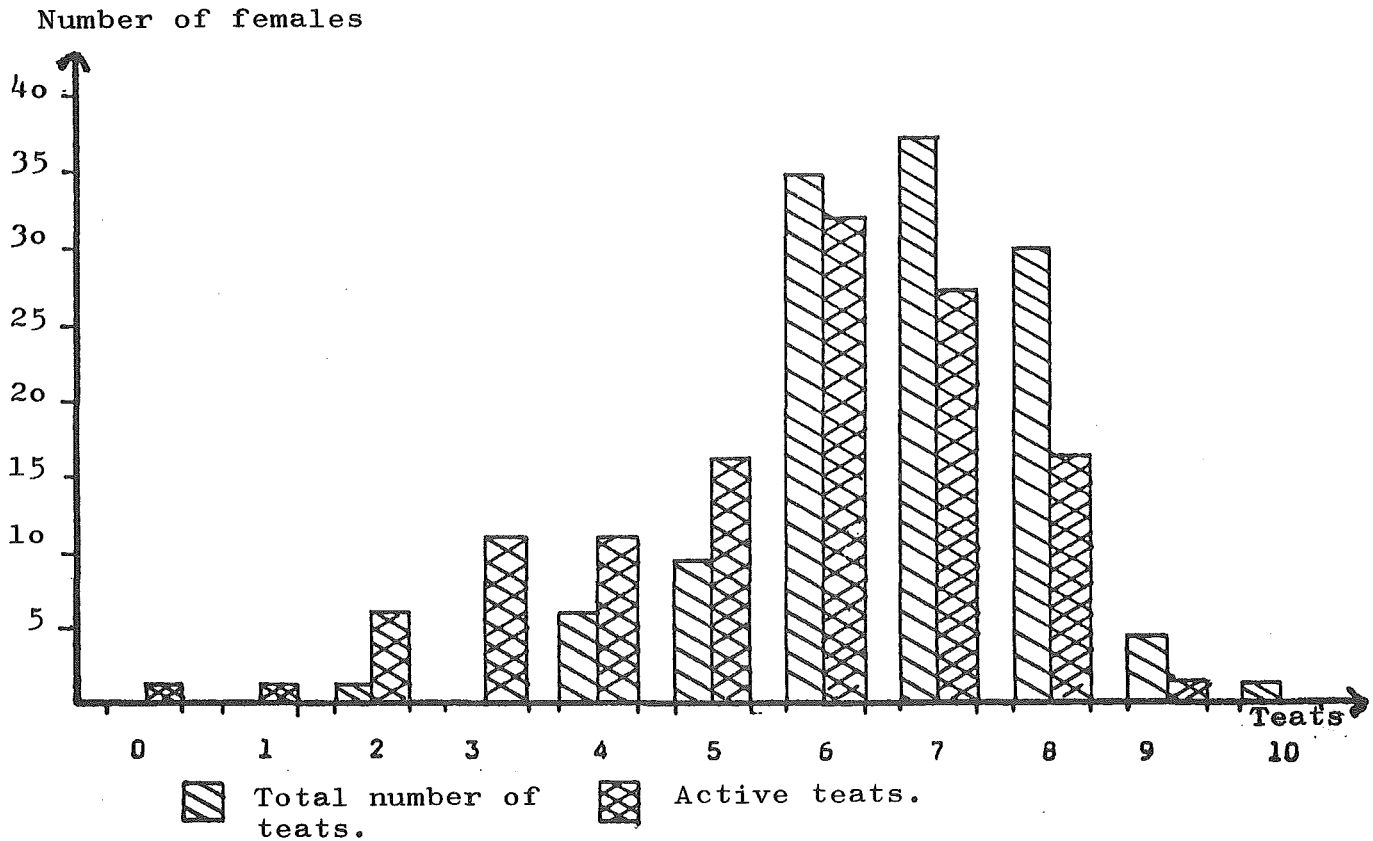
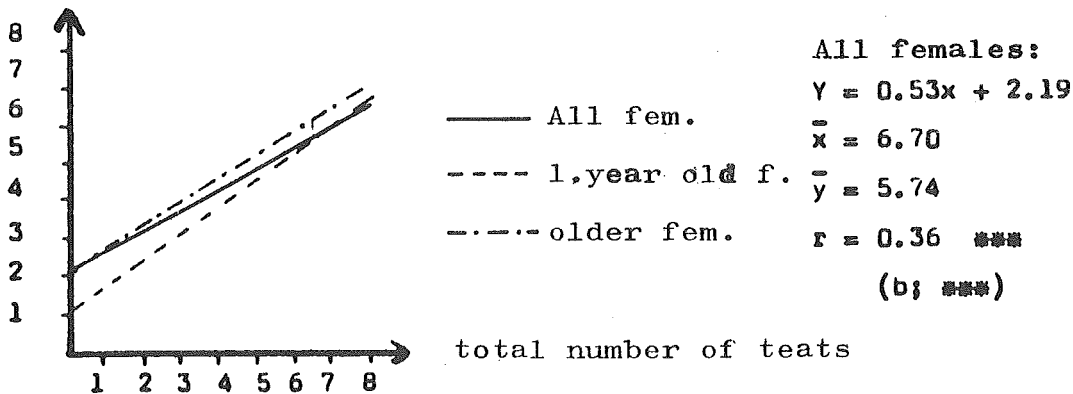


Fig. 1. Distribution of females after number of teats.

By statistical adaptation and comparison of the total number of teats and the total number of born kits, as shown in fig. 2, it is seen that the two factors is intimately connected. A selection for increase in the litter size would in this way result in an indirectly selection for an increase in the number of teats at the female.

By connection the number of functioning teats and the number of living kits per litter the first day after birth, as done in fig. 3, it is seen that there is a statistical connection in the group of old females. Such a connection is not found at the group of first year females. These relationships also point out, that a selection for increase in the litter size will result in an increase in the total numbers of teats. Moreover it has an effect in the activity of the teats.

Total number of kits per litter at birth



One year old females:

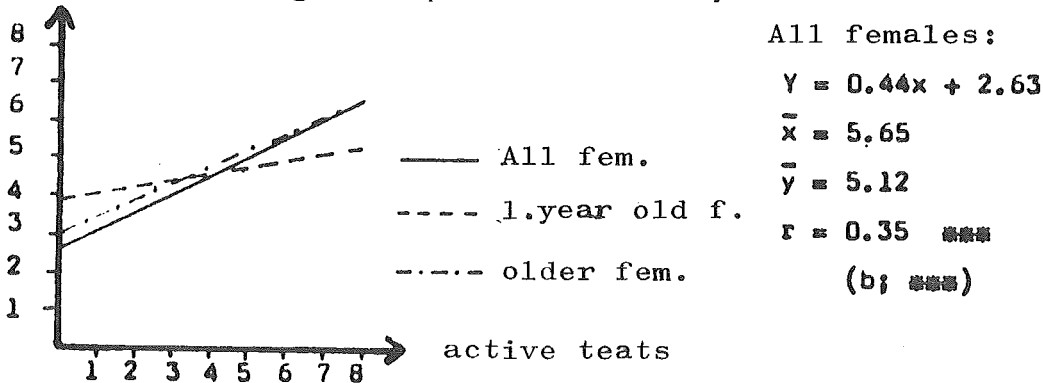
$Y = 0.65x + 1.12$
 $\bar{x} = 6.25$
 $\bar{y} = 5.18$
 $r = 0.65$ ***
 (b; ***)

Older females:

$Y = 0.55x + 2.15$
 $\bar{x} = 6.84$
 $\bar{y} = 5.91$
 $r = 0.27$ **
 (b; *)

Fig. 2. Relations between the total number of teats and the total number of kits born.

Number of living kits per litter 1. day.



One year old females:

$Y = 0.16x + 3.92$
 $\bar{x} = 4.93$
 $\bar{y} = 4.71$
 $r = 0.21$ N.S.
 (b; N.S.)

Older females:

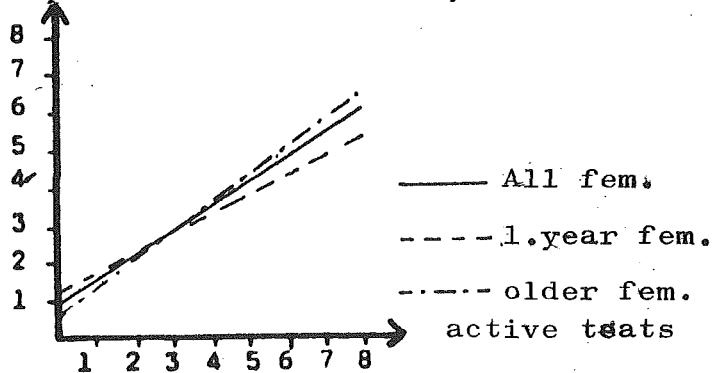
$Y = 0.57x + 3.01$
 $\bar{x} = 5.87$
 $\bar{y} = 5.24$
 $r = 0.38$ ***
 (b; ***)

Fig. 3. The relationships between active teats and the number of living kits the 1st day after birth.

It can also be seen from the same relations at the 3th day and the 7th day, that there is a good correlation between the number of functioning teats and the number of kits per litter.

This correlation is solely due to the mortality of kits in these litters, where the number of kits exceed the number of functioning teats. There will be an equilibrium in such a way, that every kit have its teat.

Kits per litter the 3th day.



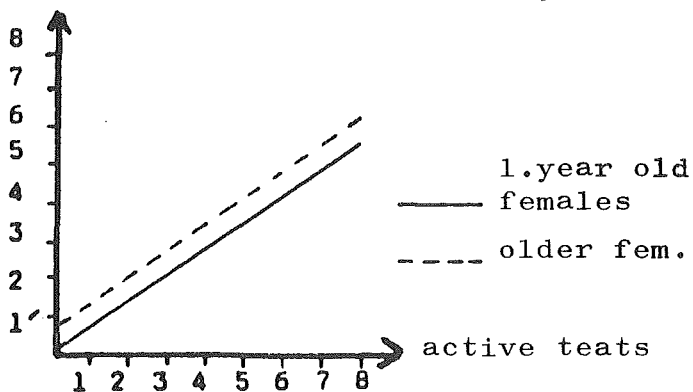
All females:
 $Y = 0.60x + 1.08$
 $\bar{x} = 5.65$
 $\bar{y} = 4.47$
 $r = 0.46$ ***
 (b; ***)

One year old females:
 $Y = 0.51x + 1.20$
 $\bar{x} = 4.93$
 $\bar{y} = 3.71$
 $r = 0.53$ **
 (b; **)

Older females:
 $Y = 0.61x + 0.89$
 $\bar{x} = 5.87$
 $\bar{y} = 4.70$
 $r = 0.41$ ***
 (b; ***)

Fig. 4. Relationship between active teats and litter size the 3th day after birth.

Kits per litter the 7th day.



1.year old females:	older females:
$Y = 0.65x + 0.13$	$Y = 0.64x + 0.76$
$\bar{x} = 4.93$	$\bar{x} = 5.87$
$\bar{y} = 3.39$	$\bar{y} = 4.52$
$r = 0.64$ ***	$r = 0.42$ ***
(b; ***)	(b; ***)

Fig. 5. Relationship between active teats and litter size the 7th day after birth.

An examination of the collected dead kits on the first check after birth, showed that only 55% of these were dead prenatal. This part can vary depending of how long time there is from birth to this examination. The present study show, that the number of kits, who normally are registered as dead prenatal, is too big. A 30-50 percent reduction of this number would more exactly give the number of still born kits.

Examinations of the ventricle of the kits who has been alive, did not show any sign of milk content. This phenomenon, that the ventricles were found empty, do not tell anything whether the kits had sucked or not.

For an adult mink, the passage rate is about four hours. From this it may be expected, that the passage rate in a kit is less than four hours, because it only suck milk.

Kits daily suck 9-11 g of milk because de demand is 2.0-2.5 g milk for one g of kit growth in the first days after birth (Glem Hansen 1978). These relative big quantity of milk (equal the weight of the kit) compared with a small ventricle tells, that the kit have to suck a number of times during the day.

These conditions suggest, that there only is a short time from the kits had sucked to the ventricle and the intestine is empty.

The observed difference in the colour of the intestine do tell a lot more about the state of nutrition of the kit, than the milk content of the ventricle. When a kit does not suck (digest liquid and nutrients) it will die, of course, but it can be difficult to see how far cause of death is absence of energy (= hunger) or it is absence of liquid (=dehydration),

Dehydration will lead to a decrease in the volume of blood, which will result in a less flow through the intestine and a more light appearance.

By the subjective grading of the intestine (1 dark - 5 light), the kits, who were dead prenatal, had the grade 3.3 (SD=1.0) and the rest had the grade 4.1 (SD=1.1). The difference was statistical significant ($P < 0.001$).

These observations seems to show, that most of the kits die because they do not suck sufficiently.

These insufficiently sucking can in most of the cases be due to a too little number of functioning teats at the female, because every kit ought to have its teat.

For a quick increase in the number of teats a direct selection is required, because the correlation between the number of kits and the number of teats is too low (0.36).

Literature:

Glem-Hansen, N. (1978). Personal information.

Hoogenbrugge, A., Baud, C.M. (1975). Antallet af dievorter hos mink og indflydelsen heraf på ungernes vækst.
Dansk Pelsdyravl, 38:354-357.

Mohr, K. (1969). Undersøgelser over patteantal, kuldstørrelse og hvalpedødelighed. Unpublished.



She knows her own worth.
Clean colour, silky and dense pelts
and - perhaps the most important -
8 functioning teats.

★ THE POSSIBILITY OF INCREASING LITTER SIZE IN MINK BY SELECTION

By E.J. Einarsson, Department of Poultry and Fur Animal Science.
The Agricultural University of Norway.

The reproductive performance of animals is very important, especially from an economical point of view. It has been thought that it is difficult to increase or decrease litter size by selection. The main reason for this is the low heritability ($h^2 \approx 0,1$). However, the heritability is not the only important factor. The selection response would also depend on the variation in litter size and the selection intensity. Thus, selection for litter size in mice has shown that it is possible both to increase and to decrease litter size at birth by selection.

For species where there is negativ maternal effect on litter size (ex. swine) the heritability estimates from daughter-dam regression and from maternal half-sibs will be low. It seems not to be maternal effect on litter size for mink. It would therefor be expected that the heritability estimate for litter size is unaffected by the method of determination and that the heritability may be larger than 0.1. The results of heritability determination, using data from the mink farm of the Agricultural University of Norway are shown in the table below.

Method of determination	Year	Number	h^2
Paternal half-sibs	1975-77	865	0.23
Regression daughter-dam	1975-77	948 (pairs)	0.21
Regression granddaughter-granddam	1977	251 (pairs)	0.29

The standard deviation for litter size at birth for 1255 litter (1975-78) is 2.18.

A selection experiment for litter size in mink started in 1978 at the Agricultural University of Norway. 3 lines are used. Selection for large litters (H), selection for small litters (L) and a randomly selected line (controlline). There are 50 females and 20 males in each line. The selection criterion is litter size at birth, including stillborn kits. The selection is done within lines and is based on an index that include litter size of the mother, her half- and fullsisters and half- and fullsisters of the father.

The response in litter size and the correlated response in other traits will be observed. The heritability and genetic correlations will be estimated. It will also be investigated if different factors between conception and parturation as eggs ovaluated and embryo survival, are affected by the selection.

Paper presented at meeting in NJF's Fur Animal Division, Elsinore, 9th-11th of October 1978, 8 pages.

2 tables, 1 fig., 13 references.

In Norwegian.

Authors abstract.



"Somehow I was hoping genetic engineering would take a different turn."

- ★ FINE STRUCTURE OF DEVELOPING SPERMATIDS USED AS A BASIS FOR STAGING OF THE SPERMATELEOSIS IN THE BLUE FOX (ALOPEX LAGOPUS).

Kjell Andersen, Dept. of Reproductive Physiology and Pathology,
Vet. Coll. of Norway, Postbox 8146, Oslo - dep., Oslo 1, Norway.

Electron microscopical studies of the developing spermatids, permitted blue fox spermatelosis to be divided into ten distinct

stages. The Golgi phase could be divided in two stages - G_1 and G_2 , the cap phase in three stages - C_1 , C_2 and C_3 , the acrosome phase in three stages - A_1 , A_2 and A_3 and the maturation phase in two stages - M_1 and M_2 . The principal criteria for this staging were: The development of the acrosome, the location and shape of the nucleus, the condensation of the chromatin, the formation and disappearance of the manchette, the formation of the postacrosomal cap and the migration of the annulus with the formation of the middle piece together with subsequent sloughing of residual cytoplasm.

The correlated differentiation of the different spermatid organelles is further discussed in relation to the development of the corresponding structures in spermatids of other mammalian species.

Zbl.Vet. Med. C. Anat. Histol. Embryol. 7, 164-181, 1978.

1 figure, 14 photos, 48 references.

In English with abstracts in English, German, French and Spanish.

Authors summary.

⊙ FINE STRUCTURE OF SPERMATOGONIA AND SPERMATOCYTES IN THE BLUE FOX (*ALOPEX LAGOPUS*).

Kjell Andersen, The Dept. of Reproductive Physiology and Pathology, Vet. College of Norway, Postbox 8146, Oslo Dep., Oslo 1, Norway.

The ultrastructural features, characterizing the different types of spermatogonia and spermatocytes in the blue fox, have been studied within and near the reproductive season, and also in the summer and autumn.

Two distinct types of spermatogonia - A and B - are described. The A-spermatogonia often have a prominent nucleolus and numerous cytoplasmic organelles, including characteristic whorls of AER. Large vacuoles containing electron dense particles are sometimes observed. In the B-spermatogonia the chromatin forms condensed

areas of varying size, and the nucleolus is usually absent. The number of cytoplasmic organelles is generally small.

Ultrastructural characteristics are further used to distinguish between the different stages in the prophase of the primary spermatocytes. In leptotene the nucleus contains a thread-like chromatin with electron dense peripheral areas. Towards the end of the stage the mitochondria display dilated cristae, and aggregations of a granular material can be observed in the intermitochondrial matrix. Zygotene is characterized by the appearance of synaptonemal complexes in the nucleus, and of the chromatoid body and piles of annulate lamellae in the juxtannuclear cytoplasm. In pachytene the chromosomes become apparent as aggregations of condensed chromatin associated with the synaptonemal complexes. The Golgi complex is more prominent than in the previous stages, and the number of the other cytoplasmic organelles is increasing. In the last stages of the prophase (diplotene and diakinesis) the chromosomes become still more electron dense, the nucleolus appears as a very prominent structure, and there is a marked vesiculation of the cytoplasm.

The secondary spermatocytes have a characteristic nucleus with a somewhat irregular outline and larger peripheral areas of condensed chromatin. In the cytoplasm a double Golgi complex is frequently observed.

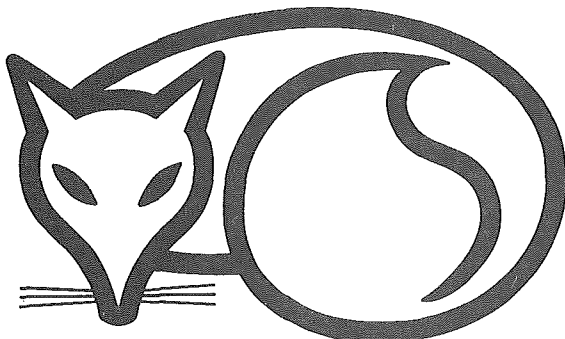
In the summer and autumn spermatocytes in zygotene seem to represent the most advanced form of spermatogenic cells.

Acta vet. scand. 1978, 19, 229-242.

13 photos, 26 references.

In English with summary in Norwegian.

Authors abstract.



- ⊛ ATTEMPTS OF DETERMINATION OF CORRELATION BETWEEN SEXUAL REFLEXES, CHARACTERISTICS OF SEMEN AND FERTILITY IN MINK.
(Próby określenia współzależności między odruchami płciowymi, cechami nasienia i plodnością nerek).

Stanislaw Jarosz, Jerzy Slawoń, Jerzy Motz, Instytut Żywnienia Zwierząt i Gospodarki, Paszowej, Akademii Rolniczej w Krakowie, 30-059 Kraków, Al. Mickiewicza 24/28, Poland.

Comparison was made between the following characteristics: libido, duration of copulation density of semen, number of motile spermatozoa, primary and secondary morphological abnormalities of spermatozoa and fertility of females in 109 minks (59 Standard and 50 Pastel).

Positive significant correlation (correlation above 0.5) was found (in both) between: density and motility of spermatozoa and between motility of spermatozoa as well as between libido and density and motility of spermatozoa in semen. Negative correlation in both Standard and Pastel of mink were found between density of semen and number of spermatozoa with primary and secondary morphological abnormalities. No correlation between the examined characteristics of semen and fertility as well as number of litter of Standard mink was found.

In Pastel mink some increase of fertility was stated as compared with the duration of copulation (from 50% to 95%), number of motile spermatozoa (50-90%) and the degree of density (70-95%).

A slight increase of fertility in both (Standard and Pastel mink) was found with the decrease of spermatozoa with primary morphological abnormalities not greater than 6%.

Roczniki Nauk Rolniczych, 1968, 90-B-4, 463-475.

5 tables, 2 figs., 11 references.

In Polish with English subtitles and abstracts in Polish, English and Russian.

Authors summary.

- ⊛ ATTEMPTS AT PROVOKING AN OESTRUM AND OVULATION AT CHINCHILLAS (CHINCHILLA VELLIGERA) USING HORMONAL INJECTIONS.
(Pròby wywołania rui i owulacji u szynszyli /chinchilla velligera/ przy użyciu preparatów hormonalnych.

Stanisław Jarosz, Instytut Żywnienia, Zwierząt i Gospodarki, Paszowej, Akademii Rolniczej w Krakowie, 30-059 Kraków, Al. Mickiewicza 24/28, Poland.

The research was carried out on 42 females which were divided into 3 groups:

- Group I. - with a naturally proceeding sexual cycle.
Group II. - taking Serogonadotrohin PMS and Gonabion HCG.
Group III. - taking Syntolutan Progesterone Serogonadotrophin and Gonabion.

In females from group I. a spontaneous ovulation was noted which took place after 45 hours since the beginning of oestrus, at the earliest, whereas during after - puerperal oestrus - 36 hours after the delivery.

In group II. the ovulation was not observed till 72 hours after the last injection of the HCG, whereas after 7 days of administering hormones there appeared swelling and reddening of external sexual organs as well as increasing of the amount and ripening of Graffian follicles 12.5 on an ovary.

In group III. after successive administering of progesterone PMS and HCG the ovulation took place after 24 hours since the last injection at the earliest and the amount of ovulation increased in the course of time till 48 hours.

Institute of Animal Nutrition.

Zootechnika Z. 13, no.87, 1973, 233-243.

1 table, 3 photos, 10 references.

In Polish with English subtitles and abstracts in English and Russian.

Authors abstract.





ORIGINAL PAPER.

★ CHOLINE CHLORIDE IN THE TREATMENT OF FATTY LIVER IN MINK.

Tapio Juokslahti, Paul Lindberg, Timo Pekkanen and Birger Sjögård,
Silmukkatie 2, 65101 Vaasa 10, Finland.

Fatty liver (hepatic lipidosis) is a very common finding in mink at post mortem investigations. It can be found in connection with infectious diseases when it is regarded to be of secondary importance, or it is the primary cause of death. When making autopsies on normal mink after pelting surprisingly many cases of fatty degeneration are found.

Causes of fatty liver

The liver plays a central role in the metabolism. Here proteins, carbohydrates and fats are objects of metabolic reactions of great diversity. In the liver bile is secreted, necessary for fat absorption. The liver also has a variety of detoxifying functions of poisons and drugs. The detoxifying effect of the liver has, however, its limits beyond which degenerative changes begin to occur. As a consequence the normal liver functions are impaired. One of the first signs of this is a fatty metamorphosis of the hepatic cells. Normally about 2-4 % of the total liver weight is made up of fat; in our laboratory we have had cases of fatty livers containing more than 50 % fat. At this stage the size of the organ is remarkably increased and as the bile secretion of a fatty liver is impaired the normal brown-red colour has changed to orange-yellow. In chronic cases with advancing degeneration of the hepatic cells the fibrous tissue of the liver increases which turns the tender fatty liver tough and has the effect of scarring: the size is diminished. This final fibrotic stage or fibrosis is also called cirrhosis.

Many different nutritional factors promote degeneration of the liver. The feed may contain deleterious ingredients as such or

toxic substances are formed as a result of chemical, enzymatic or microbial reactions. In rancid fat peroxides are formed. When peroxides decompose they give rise to aldehydes which are deleterious to the liver. When proteins are decomposed by enzymatic or bacterial activity histamine and ammonium compounds (ammonia) are formed. These have a strong effect on the liver. Also toxins produced by bacterial organisms or being the result of bacterial deterioration have toxic effects. Thus feeds of low hygienic quality can in many ways be the cause of liver degeneration in mink.

Prevention of fatty liver

An improvement of the hygienic quality of the feed to the result that as few detrimental factors as possible are enclosed is thus of primary importance. The feed ingredients as well as the final feed should have a low content of bacteria. The quality of the fat should be good. High bacterial content and rancid fats are the most common causes of low quality mink feed in Finland.

To some extent liver degeneration can be prevented by choosing a well balanced ration with sufficient amounts of protective nutrients. The protein content should be checked, especially the amount of the sulfurcontaining amino acids cystine and methionine. As protective compounds in preventing liver degeneration also the vitamins play an important role. Vitamin E prevents to a certain degree the deleterious effect on the liver of rancid fat.

An essential compound in preventing liver degeneration is choline. Choline affects the fat metabolism in the liver preventing an abnormal accumulation of fat which is the first sign of degeneration. Many feed ingredients contain choline but it can also be synthesized in the organism. For this synthesis the earlier mentioned amino acid methionine as well as vitamin B₁₂ and folic acid are necessary. Whether choline should be supplemented to mink or not depends on the choline content of the feed and on the other hand on the diverse factors regulating the choline consumption. When the hygienic quality of the feed is poor or the protein content is low the requirement of choline increases. ►

In the USSR a supplement of 20-40 mg choline chloride (commercial product) pro animal and day is recommended to the standard feed. If mortality occurs because of fatty liver or liver fibrosis 50-70 mg pro animal and day is given therapeutically. The vitamin concentrate used for Finnish mink normally contains 6 mg choline chloride pro animal and day.

Experiment with supplemental choline chloride in the feed

In the breeding season of 1977 an experiment was performed on our research station with supplemental choline chloride in the feed. 40 standard mink were given a standard ration plus 60 mg choline chloride pro animal and day. The rest of the animals served as a control group. In connection with pelting blood was collected (heart puncture) from ten males of the choline group. These were compared to five heart blood samples from the control group. The blood samples were centrifuged and the plasma separated, frozen and sent to the Central laboratory of the College of Veterinary Medicine, Helsinki, for analyses on some compounds reflecting the health condition of the animals. The results of the analyses are seen in Table 1.

Table 1. The effect of choline chloride on some blood values of mink

Blood compound			Significance
	Control group (n=5)	Choline group of diff. (n=10)	
Alkaline phosphatase (U/l)	156 ± 96	145 ± 46	
Alanine amino transferase (U/l)	206 ± 57	158 ± 50	
Aspartate amino transferase (U/l)	292 ± 86	130 ± 30	p < 0.001
Lactate dehydrogenase (U/l)	3473 ± 1147	1929 ± 1271	p < 0.05
Urea nitrogen (milli mol/l)	5.1 ± 0.7	5.2 ± 2.0	
Bilirubin (micro mol/l)	14.9 ± 5.8	1.0 ± 0.3	p < 0.001
Creatinine (mol/l)	64.6 ± 8.0	71.9 ± 6.5	
Phosphorus (milli mol/l)	1.5 ± 0.2	1.5 ± 0.4	
Protein (g %)	70.2 ± 5.6	67.8 ± 5.8	

In the table can be seen that the values of two enzymes, aspartate amino transferase and lactate dehydrogenase, are clearly higher in the control group than in the group given supplemental choline chloride. These enzymes normally occur in the liver but in connection with the liver damage have been released and have increased in the blood. According to the results the addition of choline chloride to the feed has diminished the damage of the liver cells. It can further be seen that the bilirubin value of the control group is higher than that of the choline group. Bilirubin is a bile pigment which is normally secreted in the liver and passes into the intestine with the bile. An increased bilirubin value in the blood is a sign of an impaired capability of the liver to excrete bile. Choline chloride also in this respect improved the liver function. According to this experiment a supplement of choline chloride to standard mink feed can prevent fatty liver and improve the hepatic function; an addition of 40 mg pro mink and day during the breeding season is recommended.



★ EFFECTS OF FEEDING RAW MEAT OR SOYBEAN MEAL ON BLOOD COMPOSITION IN MINK (*MUSTELA VISON*).

P. Narasimhalu, R.J. Belzile, M. Lepage, Dept. de zootechnie, Université Laval, Quebec G1K 7P4, Canada.

Twenty each of male and female Pastel mink were weaned and distributed into two similar groups so that the mean body weight was nearly the same for the two groups: one group received a control diet containing 80% raw meat mixture and the other, a diet containing 15% dehulled soybean meal (SBM), 3.5% soya oil and 29.8% raw meat mixture. Dry matter, crude protein and gross energy were nearly the same for the two diets; DM intake and weight

gain over a 16-wk period were lower with the SBM as compared to the control diet. Packed cell volume, blood glucose, serum proteins and serum lipids were unaffected by the diet, but the SBM diet increased serum levels of urea, ammonia, glutamine, methionine, phenylalanine, proline and tyrosine ($P < .01$). Unsaturated fatty acids formed 62.8% by weight in the serum of the mink. Mink fed SBM had serum containing relatively more linoleic acid whereas the control diet raised oleic and arachidonic acids ($P < .01$). Serum proteins, total lipids and phospholipids were higher ($P < .01$) in the male and blood hemoglobin and glucose were higher ($P < .01$) in the female mink. Cholesterol and phospholipids were two times higher in mink as compared to cats or dogs.

Canadian Journ. of Animal Science, 58, 191-197, 1978.

5 tables, 14 references.

English with summary in French.

Authors abstract.



★ THE USE OF KRILL SHRIMPS AS MINK FEED

Tuomo Kiiskinen, Agricultural Research Centre. Department
of Animal Husbandry.
01300 Vantaa 30, Finland.

Jaakko Mäkelä, Finnish Fur Breeders Association
Box 5, 01601 Vantaa 60, Finland

Outi Lohi, Finnish Fur Breeders Association
Box 5, 01601 Vantaa 60

Feeding and digestibility trials with Krill (*Euphasia superba*) a shrimp-like organism from Antarctic were carried out on mink. The Krill was imported from Russia in frozen form. The chemical analysis of Krill was: dry matter 20,4, crude protein 12,1, crude fat 4,6 and ash 3,0 %. A considerable amount of trimethylamine oxide 99 mg/100 g was discovered in Krill. The

digestibility coefficients were: protein 90 %, fat 79 %. The energi value (ME) thus being 825 kcal/kg or 4050 kcal/kg dry matter. The feeding trial on mink kits commenced in the beginning of July. The groups consisted of 84 kits (42 ♂ + 42 ♀). The weight gains in the control and Krill groups were 1559 g (control) and 1497 g (Krill) for males and 665 g and 618 g for females respectively. The difference was in neither case statistically significant. Compared to the starting weight the weight gain was even better in the Krill-group because of the statistically significant difference in the starting weight average of the groups. The average skin length was 70,5 cm in the control and 70,2 cm in the Krill group respectively.

The density and coverage of the hair were not as good in the Krill group as in the control group, and the number of matted skins was higher. The difference in the hemoglobin concentration of the blood was not statistically significant.

Krill shrimps can be considered a suitable protein source in mink feed. For the high price, however, the use of it is uneconomical.

Turkistalous/Finsk pälstidskrift 50, 1978 (6), 272-275
Finnish/Swedish

Author's abstract.



★ AN EXPERIMENT OF FEEDING RAW BARLEY AND OAT FOR MINK AND FOXES

Tuomo Kiiskinen, Agricultural Research Centre, Department of
Animal Husbandry, 01300 Vantaa 30 Finland.

Jaakko Mäkelä, Finnish Fur Breeders Association, Box 5,
01601 Vantaa 60.

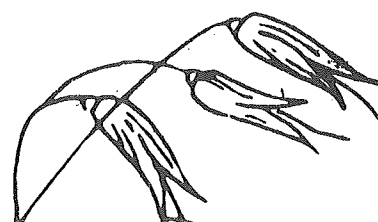
Outi Lohi, Finnish Fur Breeders Association, Box 5,
01601 Vantaa 60.

A feeding trial was carried out on mink kits and fox cubs commencing in July. About 2/3 of a conventional processed cereal, mainly wheat, was exchanged with a mixture of raw barley and oat (1:1). The total amount of cereal in feed was for mink 11 and 14 % and for foxes 15 and 17 % respectively. The feeding groups consisted of 84 mink kits (42 ♂♂, 42 ♀♀) and 16 fox cubs (8 ♂♂, 8 ♀♀). The final mean weights in mink groups were for males: control 2288 g, barley and oat 2183 g and for females: control 1202 g, barley and oat 1119 g. The difference between groups was significant only for females ($P < 0,05$). The difference in body weight for males resulted also a difference in skin length. In quality characteristics of the skin no considerable difference was found. The dry matter content of the faeces was significantly lower in barley - oat group than in control group (27,6 % resp. 33,7 %; $P < 0.001$), which proved that mink did not digest raw barley and oat as well as cooked cereal.

The use of raw barley and oat had no effect on growth, skin size or quality of fox cubs. The final mean weights for males were 7317 g (control) and 8170 g (barley - oat group) and for females 5466 g and 5835 g respectively. The mean skin length (males and females together) was in control group 87,3 cm and in barley and oat group 86,9 cm. The dry matter content of the faeces was 38,1 and 36,8 % respectively. The difference was not significant. Raw barley and oat can in considerable amount be used as cereal ingredient in feed for fox cubs over 2 months' age.

Turkistalous/Finsk pälstidskrift 50, 1978 (9), 368-371
(Finnish/Swedish)

Author's abstract



★ DIGESTIBILITY COEFFICIENT OF RATIONS USED IN THE NUTRITION OF COYPUS.

(Współczynniki strawności dawek pokarmowych stosowanych w żywieniu nitrii.)

Kazimierz Gacek, Zootechniczny Zakład Doświadczeń, Instytutu Zootechniki, 32-640, Zator, Poland.

During the experiments on nutrition of full grown coypus, the digestibility of rations were denoted for 10 typical feed sets, used on coypu breeding farms in Poland. The nitrogen balance was also denoted at coypus, fed with the investigated feed sets. On the basis of the obtained digestibility coefficients, the nutritive value - expressed in oat units - of the tested feed was calculated.

It may be stated in all probability that most adequate for full grown coypus are feed sets containing 16-17% of crude protein and less than 10% of crude fibre in the dry matter of feed diets.

Rocz. nauk. Zoot. T.3, 1, 1976, 171-176.

2 tables, 4 references.

In Polish with English subtitles. Abstracts in English and Russian.

Authors abstract.

★ THE INFLUENCE OF THE AGE OF RABBITS ON THE DIGESTIBILITY OF NUTRIENTS.

(Wpływ wieku królików na strawność składników pokarmowych).

Kazimierz Gacek, Zootechniczny Zakład Doświadczeń, Instytutu Zootechniki, 32-640 Zator, Poland.

The digestibility of four different diets were examined at two and seven months old rabbits of the White New Zealand breed.

The young rabbits better than the grown up ones digested crude

protein ($P < 0.01$), somewhat worse the ether extract ($P < 0.01$) and N-free extractives ($P < 0.05$). Not any difference in the digestibility of organic matter and crude fibre has been recorded.

Rocz. nauk. Zoot. T.3, 2, 1976, 83-87.

2 tables, 5 references.

In Polish with English subtitles. Abstracts in English and Russian.

Authors abstract.





⊛ PATHOGENESIS OF ALEUTIAN DISEASE OF MINK: IDENTIFICATION OF NONPERSISTENT INFECTIONS.

Austin E. Larsen, David D. Porter, Dept. of Microbiology,
Univ. of Utah College of Medicine, Salt Lake City, Utah 84112,
USA.

Aleutian disease virus usually produces a persistent infection and progressive immune complex disease in mink of the Aleutian genotype. Study of Aleutian disease virus infection in non-Aleutian mink showed that about one-quarter developed nonpersistent infections by the virus, and that the nonpersistence was not genetically determined by the host. The nonpersistently infected mink developed only a transient elevation of serum gamma globulin, and much lower specific Aleutian disease virus antibody titers than persistently infected mink. No lesions were found in the nonpersistently infected mink.

Infection and Immunity, 11, 1, 1975, 92-94.
2 tables, 11 references.

Authors abstract.

⊛ ALEUTIAN DISEASE OF MINK: A PERSISTENT VIRAL INFECTION.

David D. Porter, Austin E. Larsen, Dept. of Pathology, Univ. of California School of Medicine, Los Angeles, California 90024, USA.

Aleutian disease (AD) is the most important disease of ranch-raised mink from an economic standpoint. Aleutian disease virus (ADV) initially replicates as rapidly in vivo as viruses causing acute infections, but it produces a persistent infection in most mink. The disease does not appear to result from ADV replication, but rather is caused by deposition of immune complexes in tissues with subsequent inflammation. ADV appears to be an autonomous parvovirus,

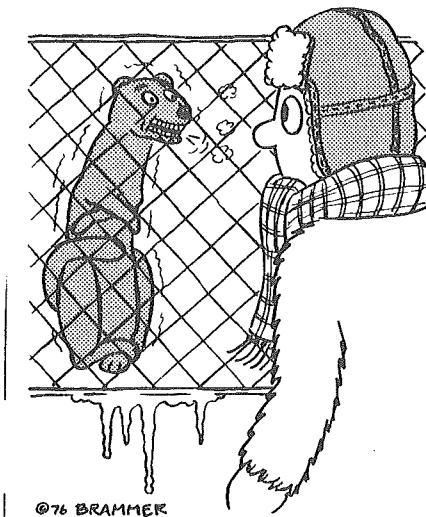
and it is temperature sensitive for in vitro replication as initially isolated from persistently infected mink. Although the mechanism by which ADV produces persistent infection is unclear, we propose testable hypotheses.

Although AD was not recognized until the coat-color mutant mink of Aleutian genotype were raised in commercial numbers, the nature of the host-virus interaction suggests that an extensive mutual adaptation has occurred. ADV replication in mink is relatively or completely innocuous. The severe disease observed during persistent infection by this agent results from the host immune response and ensuing ADV-antibody complexes which are deposited in tissue. Inadequate information exists on viral characterization and the mechanism of viral persistence in the face of an apparently maximal host immune response. The temperature-sensitive replication of the wild-type virus may well be responsible for viral persistence in vivo (17). We are currently attempting to assess this point. Alternatively, the mink antibody response to the virus may be qualitatively deficient, and this may aid persistence by encouraging phagocytosis of virion-antibody complexes which may replicate in the phagocytis cells (14). We believe that the chances are good for definning the mechanism by which ADV can persistently infect mink.

Microbiology 1977, 502-504.

18 references.

Authors introduction and
conclusion .



I am afraid that both the virus
and the antibody replication
are going to kill me!

⊕ REDUCED SEVERITY OF LESIONS IN MINK INFECTED TRANSPLACENTALLY WITH ALEUTIAN DISEASE VIRUS.

David D. Porter , Austin E. Larsen, Helen G. Porter, Dept. of Path., Univ. of California School of Medicine, Los Angeles, California 90024.

Inoculation of mink late in the second trimester of pregnancy with Aleutian disease virus (ADV) produces a persistent infection in the offspring. When these mink were analyzed at 83 days of age and compared with adolescent mink infected for a similar length of time, the transplacentally infected mink show: 1) a marked reduction in plasmacytosis, immunoglobulin level and specific ADV antibody; 2) increased amounts of infectious ADV and numbers of cells containing viral antigen; 3) a marked reduction in immune complex glomerulonephritis and absence of immune complex arteritis; 4) free ADV antigen in the glomeruli; and 5) a striking accumulation of eosinophils in the tissues. The findings suggest that the degree of ADV expression is partially immunologically controlled.


The Journal of Immunology, 119, 3, Sept. 1977, 872-876.

4 tables, 6 photos, 25 references.

Authors abstract.

⊕ CHARACTERISTICS OF INAPPARENT ALEUTIAN DISEASE VIRUS INFECTION IN MINK.

S.H. An., F.J. DePauli, P. Wright, D.G. Ingram, Dept. of Vet. Microbiology and Immunology, University of Guelph, Guelph, Ontario, Canada.

Inapparent or nonprogressive Aleutian disease virus (ADV) infection is a subclinical but persistent virus infection of mink. Mink with the inapparent type of ADV infection when subjected to stress did not develop the progressive form of the disease. 

However, when challenged with a large dose of the virus, these mink did develop progressive Aleutian disease indicating that they were not highly resistant to the virus. Sera of mink with either the progressive or the inapparent type of ADV infection did not neutralise the virus. The anti-ADV antibody activity in mink with inapparent type of ADV infection was in the IgG fraction of the serum the same as in mink with progressive Aleutian disease. These data indicate that the resistance of the mink with inapparent infection as compared to mink with progressive Aleutian disease was not due to a difference in the class of immunoglobulin response to the virus. However, mink with progressive Aleutian disease showed a greatly increased immunoglobulin response.

Research in Vet. Sci., 1978, 24, 200-204.
3 tables, 2 figs., 28 references.

Authors abstract.

★ LEAD POISONING OF RACCOONS IN CONNECTICUT.

Richard W. Diters, Svend W. Nielsen, Northeastern Research Center
for Wildlife Diseases, College of Agric. and Natural Resources,
University of Connecticut, Storrs, Connecticut 06268, USA.

A wild raccoon (*Procyon lotor*) had clinical signs, histopathologic and ultrastructural lesions indicative of lead intoxication. The diagnosis was confirmed by chemical analyses of liver and kidney tissues which revealed 35 ppm of lead in wet tissues. A survey of hepatic lead concentration in 13 additional raccoons was conducted.

Journ. of Wildlife Diseases, Vol. 14, April 1978, 187-192.
1 table, 3 photos, 19 references.

Authors abstract.





An Epizootic of Listeriosis in Chinchillas

G.G. Finley and J.R. Long, Veterinary Pathology Laboratory,
Livestock Services Branch, N.S. Dept. of Agriculture and
Marketing, Truro, Nova Scotia, Canada, B2N 5E3.

Chinchillas appear to be the most susceptible to Listeria monocytogenes of all animal species.

This report gives the findings from seven ranches and 47 chinchilla carcasses.

Owners maintained animals under conventional ranch management. Ration was mainly pellets and meal mixed locally for one rancher who sold it to the others.

Illness was first noticed five to seven days after feeding a new batch of meal. Animals were depressed, humped up, had diarrhea or constipation and often died within 24 hours of illness.

Gross pathology revealed many small white foci in liver, a few in spleen and many larger foci in gut wall. Mesenteric lymph nodes were often abscessed.

Bacteriological culture of involved organs from most animals revealed Listeria monocytogenes (serotype I).

Histological examination of liver, spleen and gut revealed focal necrosis, bacteria and neutrophils.

The initial herd was placed on oral tetracycline but refused to drink. This herd and the remaining 6 were placed on oral chloramphenicol for five days. Treatment was repeated one week later.

CT 744 was used in chinchillas to determine its effectiveness in producing safe, surgical anesthesia. Sixty chinchillas (Chinchilla vilidera), 30 males and 30 females, were injected intramuscularly in doses of 3.3, 5.5, 11, 22, 33, 44, 66, 88 and 110 mg/kg in 10, 10, 5, 5, 5, 10, 4 and 1 animals, respectively. Surgical anesthesia was produced at doses of 22-110 mg/kg. Doses of 66 mg/kg produced 2 deaths out of 10 trials, and doses of 88 mg/kg produced 1 death out of 4 trials. Induction time was rapid and smooth and ranges from 1-5 min, and duration of recumbency ranged from

Terry A. Schulz, Murray E. Fowler, Dept. of Medicine, Section on Zoo Medicine and Wildlife Diseases, School of Veterinary Medicine, University of California, Davis, CA 95616, USA.

THE CLINICAL EFFECTS OF CT 744 IN CHINCHILLAS, CHINCHILLA VILIDERA (LANIGER).

Authors summary.

Can. Vet. Journ., vol. 18, no. 6, June, 1977. 164-167. 5 pictures, 8 references. (English with summary in French).

Circumstantial evidence suggests that Listeria monocytogenes was present in the meal. Animals on 12 other ranches not feeding the meal did not experience the disease. Also, the same serotype was recovered from each involved ranch. Feed culture was negative but was carried out on heavily contaminated feed four months after the outbreak. Once it was realized the meal was the likely source its use was stopped. Good sanitation and chloramphenicol treatment reduced losses in the last 6 ranches considerably.

53-833 min, depending on dose of drug administered. Side effects were minimal and recovery was uneventful.

Laboratory Animal Science, 24, 5, 1974, 810-812.
1 table, 3 references.

Authors abstract.

⊙ CASE REPORT: SELF MUTILATION IN AN ARCTIC FOX PUP
(ALOPEX LAGOPUS).

Daniel H. Nielsen, Utica Zoological Society, Steele Hill Rd.,
Utica, NY 13501, USA.

A self-mutilation problem occurred in an Arctic Fox pup that was being hand-raised. No explanation for the problem has been determined. The Utica Zoo would be most interested in hearing from anyone who may have some knowledge or opinion on the case.

J. Zoo. An. Med. 9:2, Jun. 1978.

Authors summary.

⊙ POPULATIONS OF THE TICKS IXODES (PHOLEOIXODES) HEXAGONUS
AND IXODES (PHOLEOIXODES) CANISUGA INFESTING SUBURBAN
FOXES, VULPES VULPES.

Stephen Harris, Gordon B. Thompson, Dept. of Zoology, The University,
Woodland Road, Bristol, England.

Only two species of tick (*Ixodes hexagonus* and *Ixodes canisuga*) were found to infest suburban foxes. The populations of these two ticks were examined, their distributions within the host population described, and infestation levels of *I. hexagonus* discussed in relation to the sex, age and behaviour of the host. The most important factor regulating the level of tick infestation is probably the

degree of den usage by the host. The tick infestations were found to have minimal effect on the host, and even an abnormally high level of infestation found on one fox was not considered to be lethal.

J. Zool., Lond. 1978, 186, 83-93.

6 tables, 2 figs., 1 photo, 33 references.

Authors summary.

⊙ THE PREVALENCE OF SARCOCYSTIS SPP IN DOGS AND RED FOXES.

J.N. Farmer, I.V. Herbert, M. Partridge, G.T. Edwards, Dept. of Applied Zoology, School of Agriculture, University College of North Wales, Bangor, Gwynedd, Great Britain.

Protozoan parasites of the genus *Sarcocystis* have been recognised for many years as intramuscular cysts of numerous vertebrates. It is only comparatively recently that the two-host nature of the life cycle has been recognised and that the intramuscular cysts are a stage in the developmental cycle of coccidian parasites of flesh eating mammals (Fayer 1974, Fayer and Johnson 1973, 1974, Rommel and others 1972, Dubey 1976). Carnivores ingest the intramuscular cysts from herbivores and presumably from other animals too and eventually shed sporulated tetrazoic sporocysts in their faeces.

The cystic stages which occur in the flesh of herbivores are probably non-pathogenic but the earlier stages in which schizonts develop in vascular endothelium may be severely pathogenic. *Sarcocystis cruzi*, *S. ovicanis* and *S. porcifelis* are known to be severely pathogenic in cattle, sheep and pigs respectively (Dubey 1976).

Observations on the prevalence of *Sarcocystis* spp in the faeces of working farm dogs, greyhounds and foxes (*Vulpes vulpes*) are recorded. *Veterinary Record* 1978, 102, 78-80.

3 tables, 15 references.

Authors abstract.



COMMUNICATIONA SHORT
NOTE FROM*Bruce W. Smith*COMMITTEE STRUCTURE EFFECTIVE FOR NATIONAL
MINK & FOX CONFERENCES IN THE UNITED STATES

Bruce W. Smith, Administrative Officer, National Board of Fur Farm Organizations, Inc., Brookfield, Wisconsin 53005, USA.

The National Board of Fur Farm Organizations, Inc., is a non-profit association which is composed of 37 local, intra-state, state, regional, and national groups of mink and fox farmers, plus four larger farms which were required to have 20 or more full-time employes engaged in mink or fox propagation and/or care at the time of their admission to membership. The National Board functions as a congress, with each constituent organization electing or appointing a director to represent it.

Directors represent groups from the Atlantic to Pacific oceans and from the Canadian border as far south as mink are raised in the United States. The National Board functions in all areas of service to mink and fox farmers except advertising, promotion, and marketing.

It maintains contact with federal and state legislatures, executive arms of government, public and private researchers, and other agricultural and business associations. The National Board seeks to initiate and/or support legislation beneficial to mink and fox farmers, to obtain additional funding for fur animal research, to assist individual associations and farmers with problems particular to them, and to disseminate factual information on the U. S. mink and fox farming industry.

The Directors meet once each year (see following) and elect five officers and 10 members of an Executive Committee, four of whose members also are officers. The latter committee meets during each year at the direction of the president, either in person or by telephone conference call.

Through the years, the group has found by experience that a committee system is the most practical for consideration of the many subjects of concern introduced at each annual meeting, which encompasses two working days. Meetings are held at various sites in the northern two tiers of states. During the past six years, these sites have been in Minnesota, Oregon, Illinois, Pennsylvania, Utah, and Wisconsin. The 1979 meeting is scheduled for New York state.

The committees which deliberated subjects called to their attention and others which their members introduced were:

Finance, National Policy, Special Projects, General Resolutions, Research, By-Laws, Floor Rules, Forward Planning, Fox Farming, and Arrangements.

The names of most explain the subject matter with which they are concerned. Special Projects purposely was created to consider topics not appropriate to one or more of the other categories. Forward Planning seeks to define subject areas in which the National Board should consider future activity. Research is concerned primarily with seeking funding for investigative studies. (Another mink farmer organization, the Mink Farmers Research Foundation, actually authorizes grants and accumulates funds from farmers to help in the financing of research work.)

Committees range in size from three to five members, with the individuals serving on each appointed by the president according to

their expertise and experience in the subject area. The president serves as an ex-officio member of all committees, as does the administrative officer.

Committee reports are presented to the entire directorate for discussion, acceptance, modification or amendment, or rejection. In most cases, the reports are accepted as presented or with modifications or amendments.

This procedure saves a great deal of time which otherwise might be spent in extensive general discussion and assures, as well, that no director is overburdened with responsibilities. The committee system in no way stifles discussion; on the contrary, it encourages comments while at the same time making the general meeting proceed more efficiently.

Initiated in 1975, an annual meeting feature, Reports From Back Home, has proven extremely successful. A roll call invites each director to report to the general meeting on subjects of concern and/or importance to his or her members. In 1978, 42% of the directors present made such reports. (Frequently, a concern is similar in two or more organizations represented and one director then speaks for the two or more groups.)

For the past six years, the National Board has met outside large cities, at resorts or in small towns. The directors have found that such atmosphere contributes positively to better, more productive meetings.



BIBLIOGRAPHY
ON
FUR-BEARING ANIMALS,
FUR INDUSTRY and FURRIERY

by

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**FUR BREEDERS' ASSOCIATION
OF THE UNITED KINGDOM &
IRELAND**

FOREWORD

This bibliography stems from my endeavours to assemble a collection of books on fur-bearing animals. At the outset, I was motivated to acquire reference works related to my research interests but inevitably, over the years my horizons widened.

I have been particularly impressed by the comparative rarity of many of the titles and the difficulties involved in obtaining them either on a loan basis or for consultation. This explains why full bibliographical details are not infrequently lacking. For such omissions and any other shortcomings I trust the reader will show forbearance. On balance it seemed preferable to provide an incomplete listing than none at all.

It is my hope that the bibliography will not only prove useful but also stimulate a greater awareness of the literature on fur bearers.

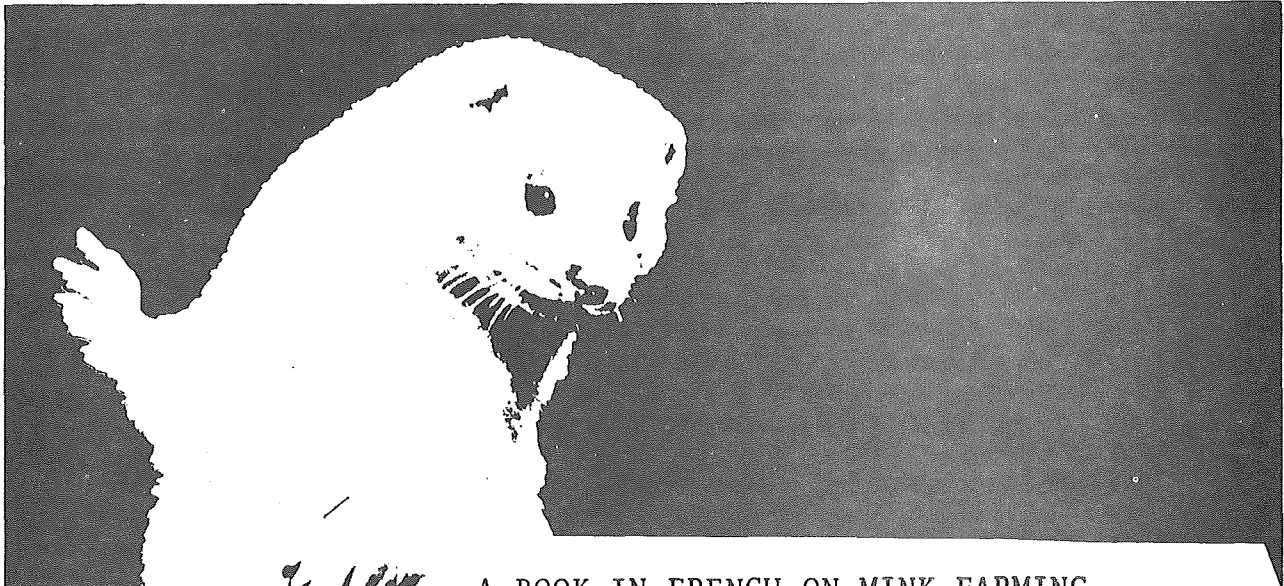
Cambridge, March 1978



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A BOOK IN FRENCH ON MINK FARMING

The Québec Department of Agriculture has recently published a book in French entitled "VISON 1978" (Agdex 475). Its format is 28 X 22 cm, glossy cover, small print with 2 columns per page, 66 pages. The book is essentially a practical guide on mink farming.



The book's chapters are as follows. 1. Mink ranching in Québec and Canada (past, present, professional associations, technical assistance). 2. Biological notes (zoo-

logical characters, life habits, digestive system, growth pattern, fur pattern, characteristics of reproduction). 3. Heridity (selection, mating systems, heridity of colors, description of types of commercial mink). 4. Nutrition (requirements, water, feeds, types of diets, monthly guide on feeding). 5. Management (guide for the various periods of the year). 6. Hygiene and pathology (diseases, cures, preventive measures, veterinary assistance in Québec). 7. Economics of initiating and operating a mink ranch (site in relation to physical needs and environmental regulations, investment costs when a full-size ranch is established over a 4-year period, cost of yearly operation, budgeting and accounting). 8. Buildings and equipment (where possible, specific designs are given or recommended). 9. Pelting (killing, preparation, classification and sale).

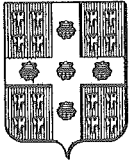
Many illustrations are given in the form of photos (pelt preparation, pelt defects, etc.) and sketches (ex. fur changes). Forms for budgeting and accounting are given. Designs for kitchen, freezer, sheds and cages are either shown or the reader is told where to obtain them.

The book is a joint effort of a committee on fur-bearing animals grouping government and university scientists, people in the feed and fur industries and mink farmers. It is a source book into which agrologists, actual and prospective mink farmers should be able to dip and find appropriate practical informations. The committee plans to revise the book periodically.

Those of you who read French may obtain, free of charge, a copy of "VISON (1978)" by writing to:

Division de l'Information,
Agriculture Québec,
200-A Chemin Ste-Foy,
Québec, Canada G1R 4X6.

Prepared by: René Belzile, Ph.D.,
Université Laval, Québec.



UNIVERSITÉ LAVAL

CITÉ UNIVERSITAIRE

QUEBEC, P. Q., CANADA

G1K 7P4

August 1er 1978

Dépt. de ZOOTECHNIE
Pavillon Comtois

SCIENTIFUR,
48H Roskilddevej
DK 3400 Hillerød,
Denmark

Sir,

Seeing the proposal for the Second International Scientific Congress in Fur Animal Production to be held in Denmark in April 1980, I am interested in it not only from the point of view of attending it but also participating in its activities.

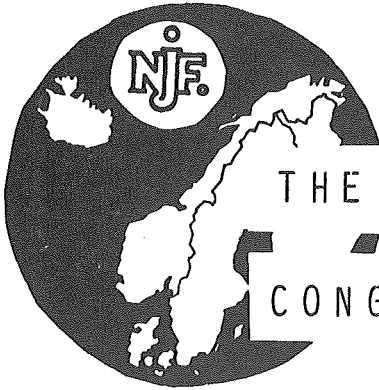
For the moment, I have no proposal to make for possible subjects but I presume that allowance will be made for participants to report on their own research.

Yours truly,

A handwritten signature in black ink, appearing to read 'René Belzile'.

René Belzile, Ph. D.
Professor of Animal Nutrition

RB/lce



THE SECOND INTERNATIONAL SCIENTIFIC
CONGRESS IN FUR ANIMAL PRODUCTION

In SCIENTIFUR vol. 2, no.2 we asked you to inform us how far you are interested to participate the SECOND INTERNATIONAL SCIENTIFIC CONGRESS IN FUR ANIMAL PRODUCTION there is planned to be held in DENMARK

APRIL 1980.

Two colleagues have until now written to us - one of the letters you can see in this issue of SCIENTIFUR.

If we shall arrange such a congress we may be sure that it have a world wide interest. Therefore we as soon as possible may know YOUR attitude to the congress, and we ask you immediately to fill out the following blank and send it to us.

Your editor

The second international scientific congress in fur animal production. April 1980.

I am interested and expect
to participate in the congress

YES

NO

Number

I am enclosing names and addresses of colleagues who also
are interested to participate the congress.

Your proposals: _____

Name: _____

Institute: _____

