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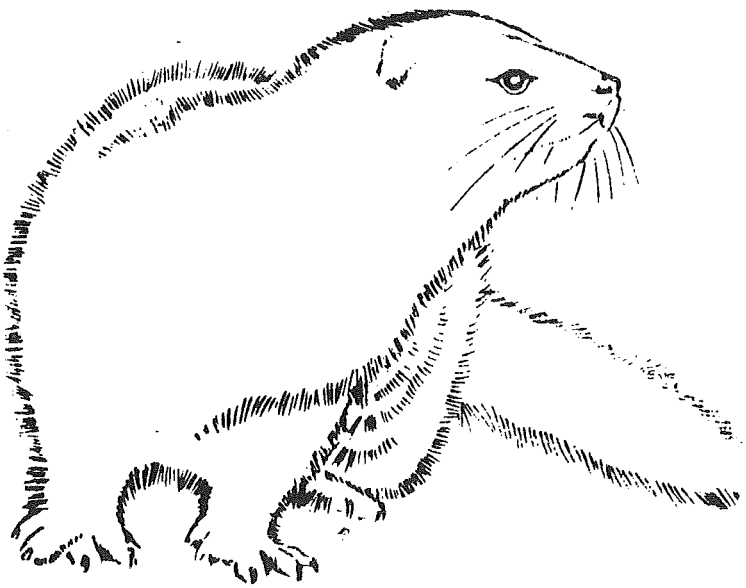

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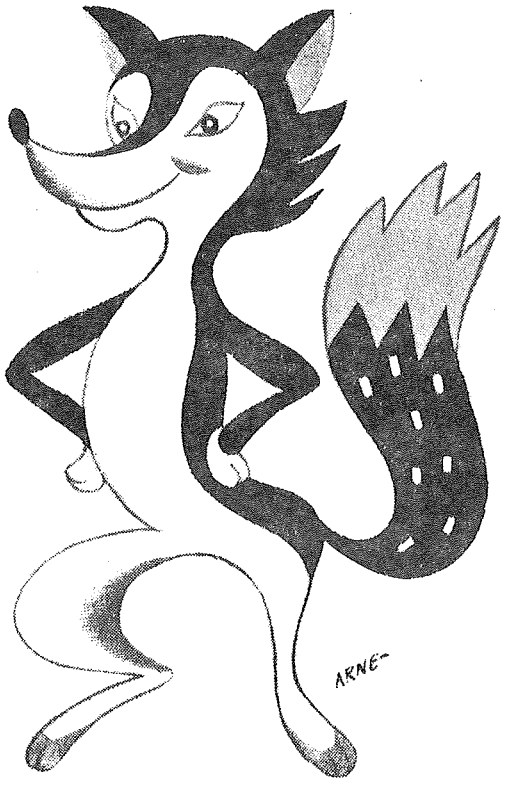


I asked for reports
which had already been
presented in SCIENTIFUR!

N O T E S

SCIENTIFUR, VOL. 7, NO. 1, 1983.

Is SCIENTIFUR going to be too scientific ? Certainly not. Nevertheless, one could get the impression that SCIENTIFUR does not cover all the hole in the scientific communication regarding fur animal production.

In December 1982 the Scandinavian scientists received a letter from Norway in which a coordinating committee for research in fur animal breeding and "health genetics" asked for references of publications and 2 copies of reports produced during the last 5 years.

Why not go through the last 5 volumes of SCIENTIFUR and on the basis of this order the specific copies wanted. The reason for this might be that the committee does not believe that it will find all the scientific reports on the topic in this way.

These thoughts brings up the question of how far SCIENTIFUR - which was established to ensure the distribution of scientific reports and knowledge - is given the right attention both from the readers and from the contributors.

If the Norwegian committee should receive one more report than could be found in SCIENTIFUR, not all the Scandinavian scientists have followed up the idea behind SCIENTIFUR.

SCIENTIFUR IS THE ORGAN OF COMMUNICATION FOR SCIENTIFIC INFORMATION CONCERNING FUR ANIMAL PRODUCTION.

As SCIENTIFUR has brought all the contributions received, it cannot be responsible for missing information.

YOU ARE RESPONSIBLE. Reasons for missing information can be of the following trends:

1. The scientist does not feel that the report is of scientific importance or proper conclusion from the experiment can not be drawn.
2. It is too much work for the scientist to write an abstract in English and send it to SCIENTIFUR.

Both of the points cannot be an excuse for missing information.

The First International Congress in 1976, where the establishment of SCIENTIFUR was discussed, concluded, that our needs were an informal scientific communication channel that is to say not only reports or abstracts but also observations, ideas, etc. should be normal matters for SCIENTIFUR to deal in.

But very few letters to the Editor have been received during the first 6 years. Therefore, if you need more information - DO SOMETHING.

SCIENTIFUR is based on unpaid cooperation between the scientists in fur animal production. Also the editing work is unpaid - therefore, dear friends, we feel that, unless it in your opinion is a great and perhaps unnecessary work to write abstracts or letters to SCIENTIFUR - and YOUR COLLEAGUES - your contribution is but small compared to the work of preparing and supplying SCIENTIFUR.

We simply feel bad when a commitee finds it necessary to ask you and us to do the same thing as we already are doing for our common information source - namely SCIENTIFUR.

This was a long story, but the National Research Institute of Animal Science in Copenhagen, of which the Dept. of Fur Animal Research is a part, has a much longer history. The institute is celebrating its 100th Anniversary in April this year. Of these 100 years the fur animal department has been in the institute since 1947 (36 years). The 1st of May 1983 your editor has been a member of the scientific staff of the

fur animal department in 25 of the 36 years. In addition to that I celebrate my own 50th birthsday at the end of April.

Therefore, I wish to invite friends and colleagues to a garden reception at my home, Birkevaenget 7, Gadevang, DK 3400 Hilleroed, on the 2nd of May 1983 from 1 pm to 5 pm.

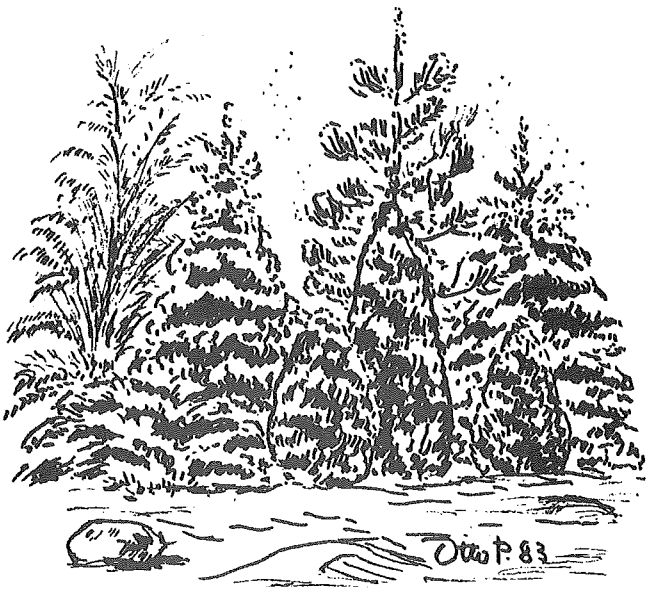
But, dear readers, don't forget SCIENTIFUR. Help us to do the work in such a way that all in the fur animal production can find the information they want.

In this issue of SCIENTIFUR you will find invitations and enrollment forms for the FBA YORK CONFERENCE 8, 9, and 10 April 1983, and the 3rd INTERNATIONAL SCIENTIFIC CONGRESS IN FUR ANIMAL PRODUCTION, Versailles, France, 25-27 of April 1984.

Kind regards

Gunnar Jørgensen

Your Editor



MINERAL COMPOSITION OF HAIR IN SOME FUR-BEARING ANIMAL SPECIES. COMMUNICATION 1. MINERAL CONTENT OF MINK AND POLAR FOX HAIR DURING COMPLETE FUR MATURATION.

V.A.Berestov, N.V.Tyurnina, N.N.Tyutyunnik. Institute of Biology, Karelian Branch of the USSR Academy of Sciences, Pushkinskaya 11, Petrozavodsk, 185610, USSR.

Mineral substances as part of biologically active compounds govern various physiological processes. They are also involved in hair formation by affecting its growth (McKlymont, 1959 et al.), pigmentation (Makhmudov, 1964, 1965; Lee, 1979 et al.) and keratinization (Padutcheva et al., 1964: Martson, 1959; Hannam, Reuter, 1977 et al.).

It has been observed that addition of microelements to the diet has a favourable influence on the fur quality of fur-bearing animals (Vasil'kov, 1963; Mikhailov, 1970 et al.) and in some pathological states it contributes to the disappearance of any signs of disease - fur "cutting" (Pokk, 1963; Babin, 1965 et al.), spine fragility (Samkov, 1972). In this connection study of the need and provision of the animals with macro- and microelements is of great practical value. According to many investigators (Neseni, 1970; Deeming, Weber, 1977; Kasperak, Kiem, 1979, et al.), one of the new methods which allows us to control organism providing with mineral substances is hair analysis.

The aim of our investigation is to study the mineral composition of hair in cage polar foxes (veil of short-haired and long-haired types) both white polar and dark-brown minks. The confidence limits

for the content of some vital elements - calcium, magnesium, zinc, copper and iron - are determined during complete fur maturation and the influence of different factors on these indices is revealed.

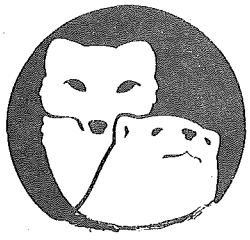
The physiological norms for macro- and microelement content were determined in clinically healthy animals showing good hematologic indices (the number of erythrocytes, hemaglobin concentration, common protein content and its individual fractions were determined) and excellent fur quality.

After some pretreatment (washing and defatting), fur samples taken near the rump were subjected to wet miniralization in a mixture of distilled acids (nitric and chloric acids, 5:1 ratio) and examined on an atomic-absorption spectrometer. The results obtained are presented in Table 1.

Table 1. Mineral content of winter fur in polar foxes and minks (mg/100g air-dry substance).

Statistical indices	Ca	Mg	Zn	Cu	Fe
		BLUE FOXES (average data)			
M	23.03	6.46	17.48	2.10	1.77
m	0.41	0.19	0.29	0.14	0.05
б	2.07	0.98	1.47	0.70	0.26
		LONG-HAIRED FOXES			
M	21.77	6.56	16.45	1.74	1.90
m	0.59	0.36	0.33	0.01	0.10
б	1.97	1.18	1.04	0.33	0.30
		SHORT-HAIRED FOXES			
M	23.95	6.39	18.16	2.40	1.69

m	0.42	0.30	0.34	0.22	0.05
♂	1.61	0.78	1.31	0.79	0.19
			WHITE POLAR FOXES		
M	26.25	4.87	74.06	3.15	13.39
m	1.28	0.33	10.13	0.23	1.54
♂	2.22	0.66	17.55	0.46	3.07
			DARK-BROWN MINKS		
M	76.74	16.48	25.70	0.94	3.30
m	2.43	0.55	0.53	0.02	0.12
♂	8.42	1.90	1.85	0.08	0.42



In the hair of veil foxes among the elements studied the highest concentration is characteristic of calcium (variation limits from 18.75 to 26.25 mg/100 g of air-dry substance) and zinc (14.88 to 20.79) their level was greatly in excess of magnesium content (4.88 to 8.63) and especially of copper (0.98 to 3.43) and iron (1.40 to 2.67) content. In the short-haired type calcium and zinc ($P < 0.01$) content increases by 10.0 and by 10.4% and copper content ($P < 0.05$) by 37.9%, as compared to the long-haired one.

It is interesting to note that the concentration of mineral substances, except Mg, is higher in white polar foxes. The most obvious differences are observed in iron and zinc content, concentration of which is 7.6 ($td = 7.55$; $P < 0.001$) and 4.2 times ($td = 5.58$; $P < 0.001$) higher than their level in veil fox hair. Copper and calcium content increases by 50.0% ($td = 3.85$; $P < 0.001$) and by 14.0% ($td = 2.39$; $P < 0.05$) and magnesium content declines by 26.4% ($td = 4.18$; $P < 0.001$). The distribution of mineral substances in polar fox hair is somewhat different. They have more zinc than calcium and more iron than magnesium and copper.

In minks, calcium content has been observed to be the highest (variation limits from 62.50 to 92.25 mg/100 g). Zinc (23.43 to 29.31), magnesium (15.81 to 20.12), iron (2.82 to 5.91) and copper (0.80 to 1.07) content is considerably lower. The concentration of calcium, magnesium, iron and zinc in mink hair is 3.3, 2.5, 1.9 and 1.5 times higher ($P < 0.001$) and copper concentration is 2.2 times lower ($P < 0.001$) as compared to that of blue fox. There are also some differences in the distribution of elements; in minks, the iron level is higher than the copper level.

Besides animals with good fur quality 12 skins of dark-brown minks showing disturbed fur pigmentation ("whitedowniness") together with 4 control ones showing good fur quality were examined. The results of this study have shown that the macroelement level in depigmented hair sharply fell (Fig.1). In spine samples, calcium content (38.29 ± 1.32) is about 73.5% with respect to the control (52.07 ± 3.00; $td = 4.20$; $P < 0.001$), magnesium concentration decreased by 25.5% (8.36 ± 0.35 against 11.22 ± 1.20 in healthy ones; $td = 2.30$; $P < 0.05$). Still more pronounced differences in macroelement content were observed when studying lateral hair. In minks with disturbed fur pigmentation, calcium concentration (28.18 ± 1.36) was about 64.2% as compared to the norm (43.90 ± 1.76; $td = 7.07$; $P < 0.001$), magnesium level decreased by 32.5% (6.86 ± 0.43 against 10.17 ± 0.58 in healthy animals; $td = 4.58$; $P < 0.001$). There were no unusual features in the distribution of elements.

These data indicate that the disturbance of melanogenesis, which makes hair to lose its natural colour, is followed by marked changes in the concentration of mineral substances, in particular calcium and magnesium.

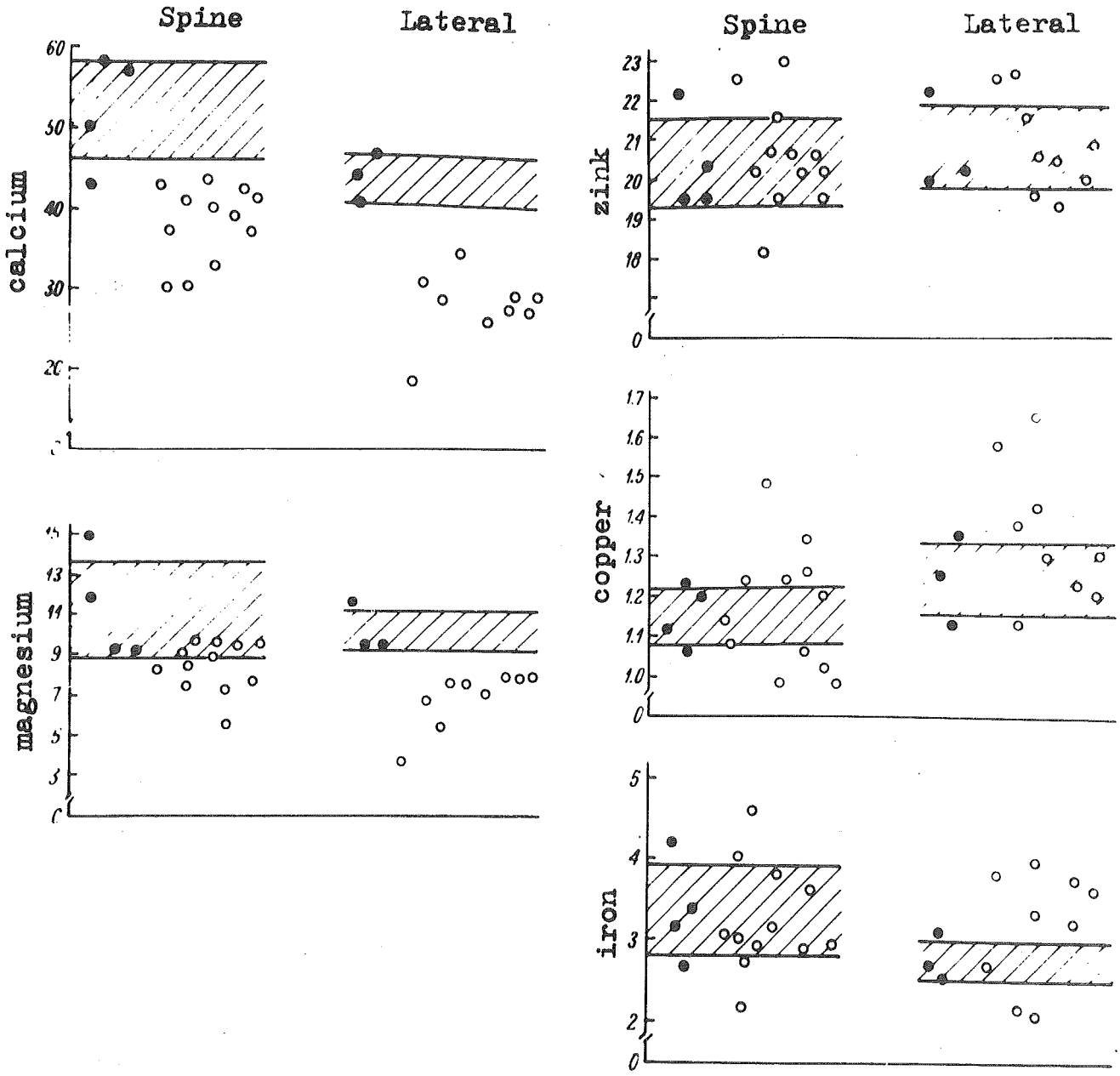


Fig.1 Mineral content of dark-brown mink hair at the normal level and in the presence of the "whitedowniness" defect.

Vertical axis - concentration of mineral substances, mg/100g. Filled circles - individual values for the macro- and microelement content of the control group of animals. Open circles - the same in experimental group. Hatched zone indicates the limits for the variation in the normal concentration of the elements given (M $\pm \sigma$).

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P.S. Figures were made by my daughter Inna.I hope you will like them.

V.A.Berestov.

MINERAL COMPOSITION OF HAIR IN SOME FUR-BEARING ANIMAL SPECIES. COMMUNICATION 2. VARIABILITY OF MINERAL COMPOSITION IN VEIL FOX AND DARK-BROWN MINK HAIR.

V.A.Berestov, N.V.Tyurnina, N.N.Tyutyunnik. Institute of Biology, Karelian Branch of the USSR Academy of Sciences, Pushkinskaya 11, 185610, Petrozavodsk, USSR.

Within a species, the mineral composition of mink and polar fox hair depends on season, sex and age.

Seasonal changes. In polar fox, samples taken during spring molting have zinc (25.92 ± 1.62 mg/100g - air-dry substance) and iron (3.73 ± 0.26) concentration 1.5 and 2.1 times higher ($P < 0.001$) than that of winter period (see previous communication); magnesium (5.76 ± 0.22) and copper (1.74 ± 0.04) concentration is 10.8 and 17.1% lower ($P < 0.05$). In animals of the long-haired type, spring hair is 1.6 and 1.9 times ($P < 0.01$) higher in zinc (25.81 ± 2.89) and in iron (3.54 ± 0.42) but is 1.2 times ($P < 0.05$) poorer in magnesium (5.45 ± 0.23) than the winter one. In polar fox of the short-haired type, zinc and iron concentrations are also observed to increase up to 26.01 ± 1.80 and 3.88 ± 0.32 mg/100g, respectively, which is 1.4 and 2.3 times higher than their winter level ($P < 0.001$); copper content declines to 1.75 ± 0.06 mg/100g i.e. it is 1.4 times lower ($P = 0.01$). In spring, no differences in the concentration of mineral substances in fox hair of both long-haired and short-haired types were revealed. In autumn, an increase in zinc quantity in animals of the short-haired type (56.99 ± 3.09 against 44.44 ± 4.15; $P < 0.05$) and iron in that of the long-haired type (6.07 ± 0.42 against 4.98 ± 0.30; $P < 0.05$) is observed.

Sexual features. In completely formed hair of long-haired fox, sexual differences are observed in the content of magnesium whose concentration in females (7.16 ± 0.38) is 1.3 times higher ($P < 0.001$) than that in males (5.50 ± 0.30). In the female hair of the short-haired type, copper concentration is 1.9 times greater than that in males (3.07 ± 0.16 in females against 1.61 ± 0.05 in males; $P < 0.001$) and that of iron is 1.2 times higher (1.85 ± 0.05 in females against 1.55 ± 0.04 in males; $P < 0.001$).

In female minks, hair is richer in calcium, magnesium and copper. Calcium content is 13.6% (81.61 ± 3.11 against 71.86 ± 2.02 in males; $P < 0.05$), magnesium - 18.6% (in females - 17.88 ± 0.52, in males - 15.08 ± 0.41; $P < 0.01$) higher. A slight but true increase in copper concentration has also been recorded ($P < 0.05$).

Age variability. The results obtained by estimating mineral content during early postnatal development (10-, 20-, 30- and 60-day-old foxes and 30- and 60-day-old minks) indicate sharp changes in the formation of "infantine" downiness. The highest calcium content was observed in 10-day-old foxes (61.46 ± 2.94). At the age of 20 and 30 days it is almost in equal quantities: 45.45 ± 1.42 and 49.96 ± 1.05 mg/100g, respectively. As compared with 10-day-old, it is 1.3 times lower ($P < 0.001$). In 60-day-old foxes calcium concentration increases to 54.12 ± 0.91 mg/100g, it is 1.2 times higher than in 20- and 30-day-old ones ($P < 0.001$), however, it does not reach the level of 10-day-old kits ($P < 0.05$).

Magnesium content is almost equal in 10-, 20- and 30-day-old animals. Its highest content is observed at the age of 2 months (13.21 ± 0.74). The maximum content of zinc (20.94 ± 0.61) and copper (1.77 ± 0.05) is recorded in the same period. In 60-day-

old foxes, zinc concentration is 1.2 times higher ($P < 0.001$), as compared with the previous age groups, in which no quantitative features in the concentration of this element were observed (variation limits: 14.75 to 21.12). The copper content is 1.5 times ($P < 0.001$) higher than the minimum concentration, observed at the age of 30 days (1.21 ± 0.07).

In the hair of 10-day-old kits iron is in large amounts - 7.42 ± 0.32 mg/100g. Then by the age of 20 days it declines to 5.14 ± 0.45 mg/100g, i.e. is 1.4 times lower ($P < 0.001$) and by 30 days is about 5.57 ± 0.41 mg/100g. In 2-month-old animals its level sharply falls (3.76 ± 0.38) to become 2.0, 1.4 and 1.5 times lower as compared with 10-, 20- and 30-day period ($P < 0.001$; 0.05; 0.01).

In minks, some differences in the zinc and iron content were observed. Their concentration in 2-month-old animals (22.49 ± 0.59 and 6.24 ± 0.59, respectively) was 1.6 and 1.3 times higher ($P < 0.001$; 0.05) than that in 1-month-old ones (14.31 ± 1.14 and 4.71 ± 0.16).

Physiological limits for the mineral content of veil fox and dark-brown mink hair assessed in the course of our investigation can be a basis for the control over the provision of the animals with these elements and for the study of etiology and pathogenesis of some disease, followed by disturbance of fur formation.

For more detailed evidence see references.

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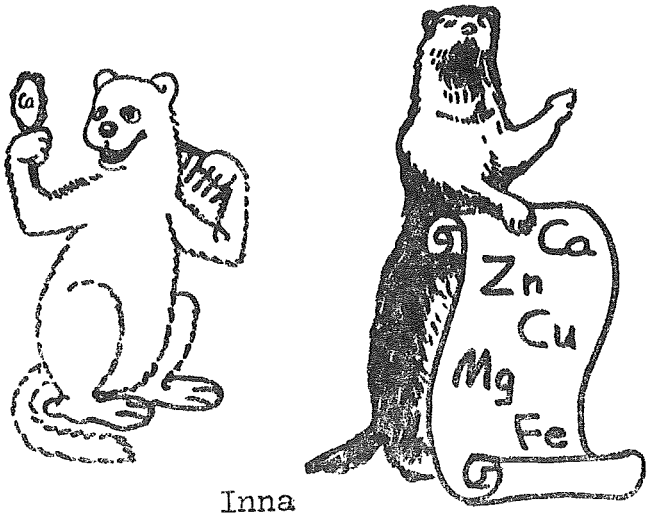
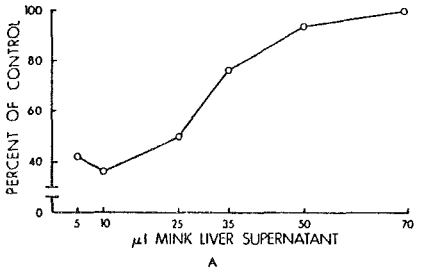


Inna

TYROSINE AMINOTRANSFERASE DEFICIENCY IN MINK (MUSTELA VISON). A MODEL FOR HUMAN TYROSINEMIA II.

Lowell A. Goldsmith, Judith M. Thorpe, Richard F. March, Div. of Dermatology, Dept. of Medicine, Duke University Medical Center, Durham, North Carolina 27710, USA.

Mink pseudodistemper, a recessive disease associated with high blood tyrosinelevels, is an animal analogue of the human inborn error of metabolism, tyrosinemia II. Affected mink and man have eye and skin lesions. Affected mink have no hepatic tyrosine aminotransferase (TAT) activity, as measured immunologically and biochemically. Hepatic mitochondrial aspartate aminotransferase is increased to 188% of control. This new genetic animal model of TAT deficiency should allow new studies of tyrosine metabolism.



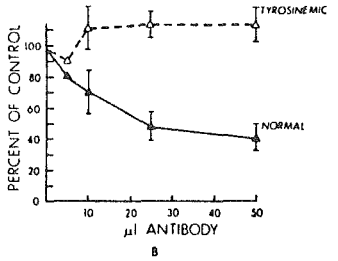
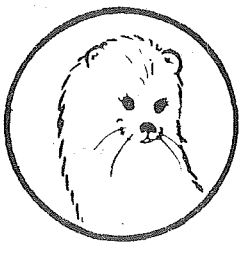


Fig. 1. (A). Normal mink TAT (0–70 µl) was preincubated with 25 µl anti-rat TAT (145 µg protein/ml) for 5 min at 37 C and assayed for TAT. Activity was calculated as percentage of uninhibited control for each amount of enzyme.(B). Various amounts of anti-rat TAT (145 µg protein/ml) were preincubated for 5 min at 37 C with 20 µl of enzyme from several normal and abnormal mink liver TAT preparations. After preincubation, mixtures were assayed for TAT, and activity was calculated as percentage of uninhibited controls. The means ±SD for four abnormal and three normal mink are illustrated.

Biochemical Genetics, Vol. 19, Nos. 7|8, 1981.
1 table, 1 fig., 16 references. Authors' summary.



SEASONAL VARIATIONS IN MINK (MUSTELA VISON) PLASMA PROLACTIN MEASURED BY HETEROLOGOUS RADIOIMMUNOASSAY.

Lise Martinet, J.P. Ravault, Monique Meunier, Dept. de Physiologie Animale, Inst. Natl. de la Recherche Agronomique, 78350-Jouy-en-Josas, France.

Monthly prolactin levels were measured in mink by a heterologous radioimmunoassay using porcine SP162C as the labeled hormone and an anti-ovine prolactin guinea-pig serum. The yearly variation of plasma prolactin concentration closely followed the daylength ratio throughout the year in males as in females.

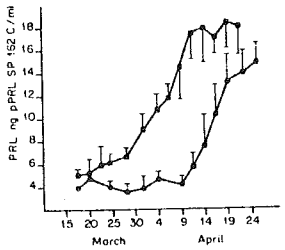


FIG. 3. Prolactin levels in 5 control females (■) and 5 females treated with bromocryptine (●) from March 22 to April 9. All values are means ± SEM.

General and Comparative Endocrinology, 48, 71-75, 1982.
4 figs., 19 references. Authors' abstract.
In English.

HISTOCHEMICAL AND ULTRASTRUCTURAL STUDY OF EPITHELIAL CELLS OF SMALL PANCREATIC DUCTS IN MINK.

Claudio A. Ferraz de Carvalho, Dept. de Anatomia, Inst. de Ciències Biomèdicas, Universidade de Sao Paulo, Caixa Postal 4365, 01000 Sao Paulo, SP, Brasil.

We attempt an ultrastructural and histochemical study of the intercalary and intralobular pancreatic ducts in mink.

The histochemical reactions performed are suggestive of the presence of

glycogen, sulphated acid mucosubstances and neutral mucosubstances in the apical pole of the epithelial cells. The reactions to the following enzymes were positive: AcPase, unspecific esterases, SDH, G-6-PDH, LDH and MAO. The following were negative: AlkPase, ATPase and Beta-D-glucuronidase; we obtained a mild reaction to TPPase.

The ultrastructural findings are not morphologically suggestive of a very important role of the epithelial cells of the small pancreatic ducts in the process of absorption and secretion.

Rev. Bras. de Pesquisas Med. e Biol. 13 (4-6) 203-209, 1980.
15 figs., 31 references. Author's summary.
In English with abstract in Spanish.

ACTIVITIES OF SOME ENZYMES IN THE TISSUES OF THE BLUE FOX (ALOPEX LAGOPUS).

J. Työppönen, T. Juokslahti, Dept. of Animal Hygiene, Coll. of Vet. Med., Swedish University of Agricultural Sciences, 750 07 Uppsala, Sweden.

The acitivities of aspartate aminotransferase (AST), alanine aminotransferase (ALT), ornithine carbamoyltransferase (OCT), sorbitol dehydrogenase (SDH), γ-glutamyl transferase (GGT), alkaline phosphatase (AP), lactate dehydrogenase (LDH) and creatine kinase (CK), were determined in eight organs of 10 healthy male blue foxes. OCT was absolutely liver specific and ALT was also found to be liver specific.

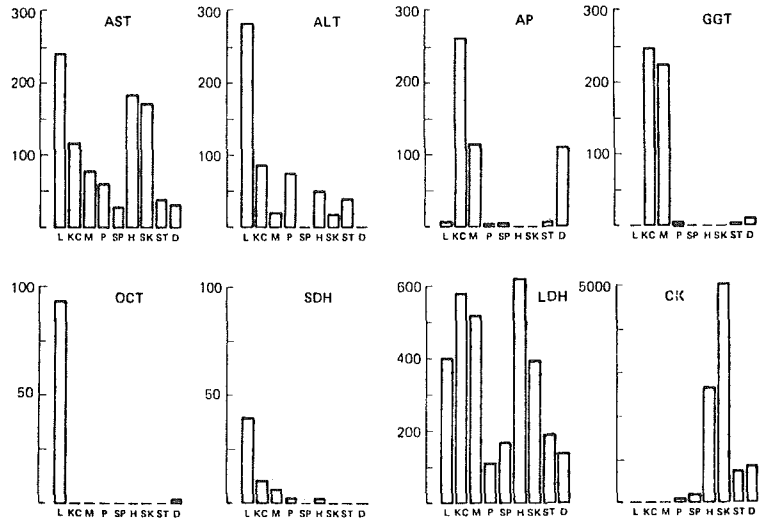


FIG 1: Enzyme activities in the tissues of the blue fox, expressed as μkat/100 g wet weight of tissue (1 μkat = 1 μmol substrate coenzyme converted per second). The vertical bars represent the mean enzyme activity in the tissues of 10 animals. L = liver, KC = kidney cortex, M = kidney medulla, P = pancreas, SP = spleen, H = heart muscle, SK = skeletal muscle, ST = stomach, D = duodenum

SDH was also found primarily in the liver but its activity was relatively low. GGT was found almost exclusively in the kidneys. The highest levels of AP were observed in the kidneys and in the intestines. LDH together with AST was present in high activities in all the tissues tested. CK activity was highest in skeletal and cardiac muscles.

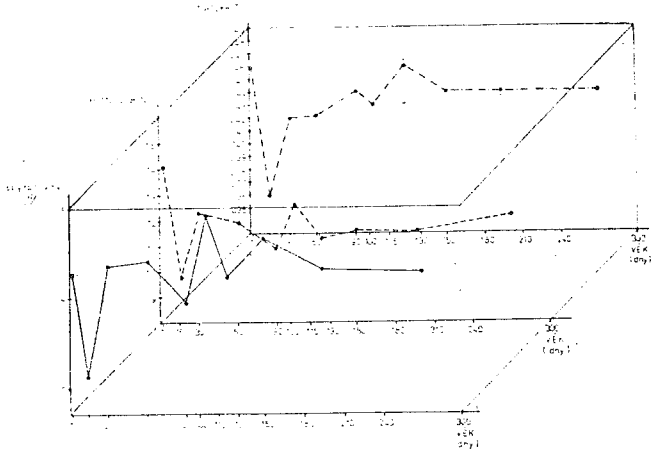
Research in Veterinary Science 1982, 33, 295-297.
1 fig., 16 references. Authors' abstract.

THE RED BLOOD PICTURE IN MALE COYPU IN THE POST-NATAL PERIOD.

(Cervený krevni obraz u samcu nutrii v postnatlim obdobi).

P. Jelinik, M. Glasrova, University of Agriculture Brno, Zemedelska 1, 662 65 Brno, Czeshoslovakia.

Blood was sampled by heart puncture from healthy male coypus of ten age categories (from 1 to 300 days). The basic haematological values of the red blood picture were determined in these samples, including the erythrocyte count, haemoglobin content, haematocrit reading, mean corpuscular haemoglobin, mean corpuscular haemoglobin concentration, and mean corpuscular volume. The summarized mathematico-statistical characteristics were calculated from the values obtained in each group and the significance of differences was determined by the analysis of variance at significance levels of P=0.01 and P=0.05.



1. Množství erytrocytů, hemoglobinu a hematokritové hodnoty — Erythrocyte count, corpuscular haemoglobin, haematocrit readings

Veterinarni Medicina, 1982, 227-236.
2 tables, 1 fig., Authors' abstract.
In Czechoslovakian with summaries in Russian, English and German.

ACTIVATION AND PATTERN OF PROTEOLYTIC ENZYMES IN PANCREATIC TISSUE FROM RAT, PIG, COW, CHICKEN, MINK AND FOX.

Åshild Krogdahl, Halvor Holm, Dept. of Poultry and Fur Animal Science, Agricultural Univesity of Norway, N-1432 Ås-NLH, Norway.

1. The activation, activity, and pattern of trypsin, chymotrypsin, and total proteinase in pancreatic tissue extracts from rat, pig, cow, chicken, mink and fox were compared.
2. The activation of chymotrypsinogens progressed in a similar pattern whereas great differences in activation of trypsinogens were revealed.
3. On a normal feeding regime, after an overnight fast, the caseinolytic activity of pancreatic extracts ranked as follows: pig > mink > rat > cow = fox > chicken.
4. Corresponding relationships were found for trypsin but not for chymotrypsin activity.

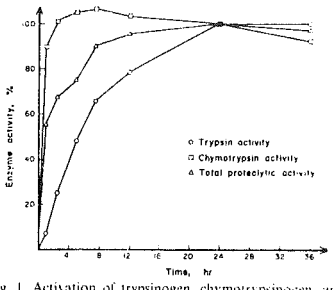
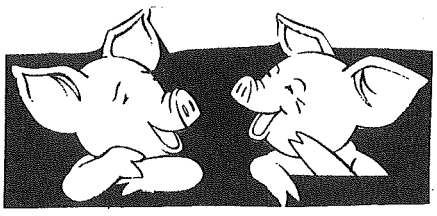


Fig. 1. Activation of trypsinogen, chymotrypsinogen, and total proteinases in extracts of pancreatic tissue as a function of time after initiation of activation. The graphs represent means of the activation of enzymes from rat, pig, cow, chicken, mink and fox by bovine trypsin at 4 C.

Comp. Biochem. Physiol, Vol. 72 A, No.3, 575-578, 1982.
3 tables, 1 fig., 23 references. Authors' abstract.



Regarding caseinolytic activity we are better than the minks!

GASTRIC ULCERS IN MINK FED RAW SQUID.

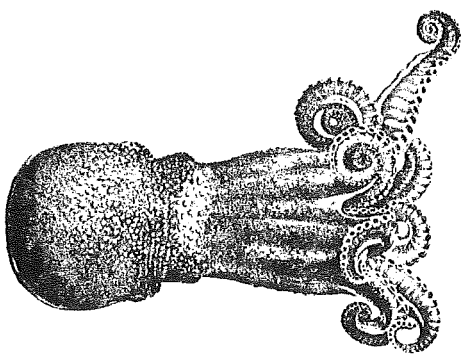
A. Skrede, Dept. of Poultry and Fur Animal Science, N-1432, Norway,
N. Koppang,Natl. Veterinary Institute, Box 8156 Dep, Oslo 1, Norway.

In a series of experiments, raw squid (Todarodes sagittatus (Lamarck)) was fed to mink. Dietary levels of 34 % squid from February 5 to 3 weeks post partum caused reduced litter size, increased kit mortality and reduced body weights of kits and mother females. The effects of 17 % squid were less severe, but kit growth was significantly reduced. In a second experiment, mink kits were fed raw squid from July 30 to November 17. Two levels of squid (9 and 18 %) were fed to groups of 86 animals each. The 18 % level caused impaired body growth and excessive mortality, starting 1 month after the initiation of the experiment. The necropsy revealed that the poor performance and death were caused by severe gastric ulcers, in some cases leading to perforation. At pelting time, most of the surviving animals fed 18 % squid was demonstrated to suffer from gastric ulcers. Feeding of 9 % raw squid resulted in a few mortalities because of gastric ulcers, while no cases were found in the control group. The further studies indicated that the factor causing gastric ulcers was inactivated by heat treatment.

Norsk Pelsdyrblad 56, 301-303, 1982

3 tables, 2 figures

In Norwegian Authors' summary



FUR PRODUCTION IN THE SCANDINAVIAN COUNTRIES.

Paavo Niemelä, Finnish Game and Fisheries Research Institute, Fur Animal Research, 69100 Kannus, Finland.

The Scandinavian countries, Finland, Denmark, Norway and Sweden, are the main suppliers of farm produced pelts.

From 1971 to 1980 has the world production of mink pelts varied from 16.6 to 20.7 million pelts a year, the Scandinavian production amounting up to 51.2-48.3% of it.

The blue fox production has during the same interval increased from 500,000 to 2,340,000 pelts, of which 55.0-78.8% has come from Scandinavia.

The main mink produceres in Scandinavia, and as a matter a fact the most important mink farming countries in the whole world, are Denmark and Finland. In 1980 the Danish production covered 29.3% and the Finnish production 18.6% of mink pelts sold on the free markets. In regard of blue fox is the farming even more concentrated to the Northern countries. In 1980 Finland totalled 59.8% and Norway 13.5% of world's production.

Number of fur farms and number of pelts sold by the Scandinavian auction companies in 1980-1981. (the percentage after the number refers to the increase or decrease compared to previous season)

	Number of local associations	Number of fur farms		Minkpelts		Foxpelts		Finnraccoon pelts		Fitch pelts	
				number	%	number	%	number	%	number	%
Finland	7	4372	+24.9	3.748.193	+ 9.9	1.465.572	+30.2	60.247	+248	133.967	+526
Denmark	5	3019	+ 8.2	3.892.036	+ 8.6	98.371	+26.9	741		4.981	
Norway	32	2345	+ 1.o	806.000	- 15	406.729	+29				
Sweden	15	618	+ 1.5	1.184.392	+ 1.9	41.855	- 2.6			8.071	

The main colour type among mink in Scandinavia is scanblack (dark mink). The shares of scanblack of the total minkproduction in 1980-1981: Finland 64.4%, Denmark 48.8%, Norway 53.0%, and Sweden 50.0%. The most pupular after scanblack have during the 1980's been the dark brown colours: scanbrown and pastell. In fox production is the blue fox clearly dominant. In 1980-1981 the share of blue fox was: in Finland 85.7%, in Denmark 78.2%, in Norway 75.9%, and in Sweden 42.6% of the total amount of fox pelts.

The relative differences in mean prices of Scandinavian countries in the auction season 1980-1981:

	Denmark	Finland	Norway	Sweden
Mink (total)	100	84	90	90
Scanblack	100	84	89	89
Blue fox	91	94	100	90
Silver fox	92	100	96	85

Finsk Pälstidskrift, 54,2, 112-114, 1982.
6 tables, 7 references. Author's abstract.
In Swedish.

LIVESTOCK PRODUCTION IN EUROPE. PERSPECTIVES AND PROSPECTS. IX. FOXES AND MINK.

G. Jørgensen, Natl. Institute of Animal Science, Dept. of Fur Bearing Animals, Roskildevej 48 H, DK 3400 Hilleroed, Denmark.

This discussion includes consideration of the development of animals for skin production, and future prospects in the breeding of fur bearers.

Livestock Production Science, 9, 1/2, 251-255, 1982.
3 tables. CAB-abstract.

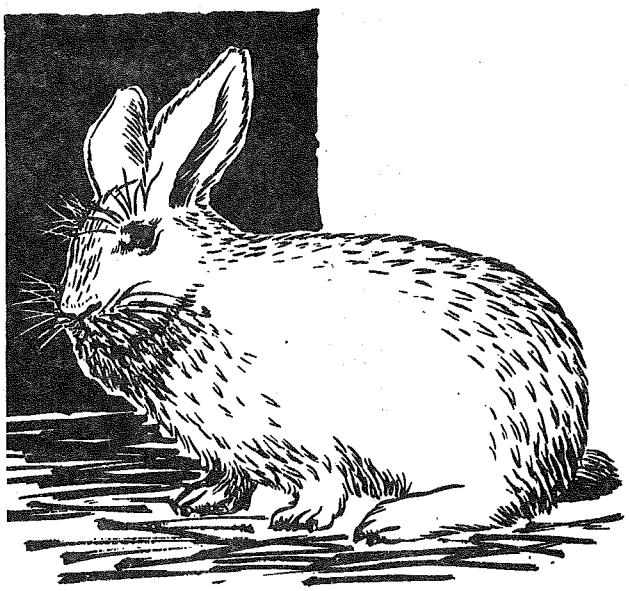
EXAMPLES OF TEMPERATURE-SENSITIVE PIGMENT FORMATION IN CHINCHILLA RABBITS WITH THE PIGMENT GENE B (E) IN VARIOUS DISTURBANCES REDUCING SKIN TEMPERATURE (MALNUTRITION, GOITER, SPASTIC PARALYSIS).

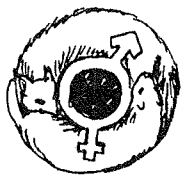
(Beispiele für temperaturempfindliche Pigmentbildung bei Chinchilla-kaninchen mit dem Pigment-Gen b(e) bei verschiedenartigen Störungen, die die Hauttemperatur herabsetzen (Unterernährung, Kropf, spastische Lähmung).

Karin Magnussen, Hagenauerstr. 7, D-2800 Bremen.

The publication of 1968 is continued with additional observations on Gelbsepia- and Schildpattsepia-rabbits (chinchilla without aguti: c^{ch}eBDa and c^{ch}eBda), whose pigmentation is sensitive to temperature. Because the critical temperature of skin pigment formation is higher than at himalayan rabbits, they are qualified for investigation applying of the influence of pathological factors on skin-temperature. Goitre (mechanical effect) and hereditary spastic paralysis (nervous disturbance) are increasing the local pigment formation. Reduction of skin-temperature by such disturbances is visible by pigmentation.

Zoologische Beitrage (Berlin, Duncker & Humblot.) 1981, 27, 1. 133-142.
7 figs., 20 references. Author's summary.
In German with summary in English.





A NEW ALLOTYPE OF THE IMMUNOGENETIC SYSTEM OF VERY-HIGH-DENSITY Lpm-LIPOPROTEIN IN THE BLOOD SERUM OF MINKS-Lpm-6.

O.K. Baranov, M.A. Savina, V.I. Ermolaev, Inst. of Cytology and Genetics, Siberian Branch of the Academy of Sciences of the USSR, Novosibirsk.

In this work we present preliminary data on the identification, genetic control, and phylogenesis of a new allotype of the Lpm system, on which the symbol Lpm 6, which has become free was conferred.

The work was performed on mink of the experimental farm of the Siberian branch of the Academy of Sciences of the USSR. With the aid of newly obtained alloantiserum for Lpm 6, as well as alloantisera for the remaining Lpm antigens, we tested 1217 individual mink sera.

We established the strict hereditary determination of the presence or absence of Lpm 6 in mink in special crosses. The X^2 test for conjugation in the appearance of antigenic markers showed the presence of a relationship of Lpm 6 to the remaining Lpm allotypes. No dependence of Lpm 6 on the sex and the Ldl allotype of the low-density-lipoprotein system was detected. The statistical data permit us to assume that Lpm 6, together with the previously described Lpm allotypes, belong to the same system of genes localized on the autosome.

Since the number of haplotypes at the Lpm locus remains as before, despite the possibility of typing Lpm 6, the number of genotypes predictable theoretically and detectable by genetic analysis also was not increased and remained equal to 36. Thus, the existence of Lpm does not lead to a quantitative increase in the genotypic variety with respect to the Lpm system, but only permits the recognition of still another gene in the gene complexes of Lpm and the detection of 22 instead of 21 genotypes in mixed populations. Such a situation is due to the fact that Lpm 6 does not form new allotypes (haplotypes) but is contained in most

of those already detected. The detection of a new Lpm 6 antigen is still another step toward the disclosure of the complex organization of the genetic locus carrying information for the synthesis of allotypic variants of the Lpm-lipoprotien molecules.

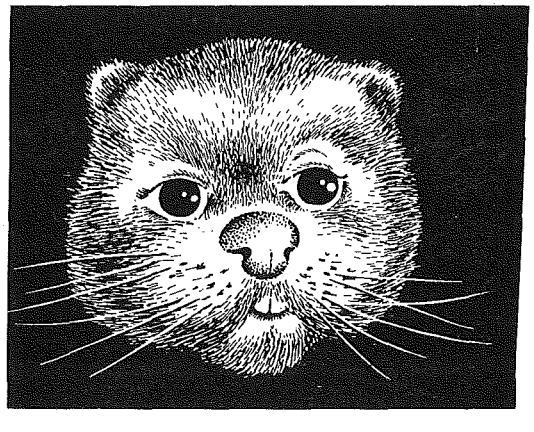
Translated from Doklady Akademii Nauk SSSR, Vol. 251, No. 6, pp. 1513-1516, April 1980.
0012-4966/80/0304-0174$07.50 1980 Plenum Publishing Corporation.
1 fig., 1 table, 10 references. Abstract by G. Jørgensen
In English.

ISOLATION AND SOME PROPERTIES OF THE VERY HIGH DENSITY Lpm-LIPOPROTEIN FROM MINK SERUM.

V.I. Ermolaev, O.K. Baranov, Inst. of Cytology and Genetics, Siberian Branch of the USSR Academy of Sciences, Novosibirsk.

A procedure for isolation of a very high density Lpm-lipoprotein (Lpm) consisting of 7-15% polyethyleneglycol precipitaition and subsequent gel-filtration on a bio-gel A-5m column was developed. An immunoelectrophoretically pure Lpm with molecular weight of about 800,000 was obtained. The procedure used does not change the allo- and heteroantigenic properties of Lpm.

Biokhimiya, 45 (7), 1980, 1208-1214, 1980.
5 figs., 5 references, Authors' summary.
In Russian with summary in English.



DIALLELISM OF THE LOCUS CONTROLLING Ld-ALLOTYPES OF THE LOW-DENSITY LIPOPROTEIN OF MINK (MUSTELA VISON SCHR.) SERUM.

M. A. Savina, O.K. Baranov, Inst. of Cytology and Genetics, Siberian Branch, Academy of Sciences of the USSR, Novosibirsk.

In the present article, data are presented about a new allotype Ld2 which is determined by an allele of the gene coding for Ld1.

The mink alloimmune serum anti-Ld2 was immunochemicallly different from Ld1 and other immunogenetic antigen markers tested in the laboratory.

A significant linkage was observed only for the allotypes Ld2 and Ld1. Apparantly, there is no linkage between Ld2 and the sex gene, as well as with the allotypes of the Lpm-system. The data provide evidence of Ld1 and Ld2 belonging to a single immunogenetic system controlled by an autosomal locus which is independent of Lpm.

Based upon the hypothesis of the control of Ld1 and Ld2 by allelic genes, the theoretically expected numbers of phenotypes were calculated. The statistical correspondence between the number of observed and expected phenotypes conforms the hypothesis about the allelic nature of the genes Ld1 and Ld2 and indicates the gene balance in the mink population analyzed.

On the basis of the experimental data presented here, several other results not included in the present paper, and the experience of numerous alloimmunizations already carried out for many years with whole serum, we can believe that the Ld-system of the mink LDL allotypes differs from the above-mentioned systems. It belongs to the group of much simpler systems, and, in all probability, it is controlled by a locus having only two alleles.

Translated from Doklady Akademii Nauk SSSR, Vol. 252, No. 1, pp. 226-228, May 1980. - 0023-4966/80/0506-0236$07.50 - 1980 Plenum Publishing Corporation.

2 figs., 2 tables,12 references. Abstract by G. Jørgensen

In English.

CYTOGENETIC INVESTIGATIONS IN FARM FUR-BEARING ANIMALS. I. G-BAND PATTERNS IN MINK CHROMOSOMES (MUSTELA VISON, MUSTELIDAE, CARNIVORA, MAMMALIA).

Agripina Lungeanu, I. Voiculescu, St. Memteanu, The "Pasteur" Institute for Veterinary Research and Biological Products, Bucharest, Roumania.

In order to establish a common language in describing of chromosomal changes related to fertility and prolificity disturbances as well as to embrionary mortality, it is imperative to standardize the nomenclature for the banding patterns in the farm fur-bearing animal karyotypes.

The normal mink karyotype was previously studied by FREDGA (1961) and NES (1962). MANDHAL and FREDGA (1975) described the Q-, C- and G-bands in mink chromosomes.

In this paper a G-bands description in the mink chromosomes is presented.

4th Eur. Colloq. Cytogent. Domest. Anim. 1980, pp. 406-411.
2 fig., 1 table, 5 references. Authors' summary.

CHROMOSOME LOCALIZATION OF THREE SYNTENIC GENE PAIRS IN THE AMERICAN MINK (MUSTELA VISON).

N.B. Rubtsov, S.I. Radjabli, A.A. Gradov, O.L. Serov*, Inst.* of Cytology and Genetics, Siberian Branch of the Academy of Sciences of the USSR, Novosibirsk.90, 630090 USSR.

Twenty eight American minkxChinese hamster somatic cell hybrids were analysed for the expression of mink enzymes and for mink chromosomes. The results of this analysis made it possible to assign the genes for phosphoglucomutase-1 and phosphogluconate dehydrogenase to chromosome 2, those for lactate dehydrogenase A and glucose phosphate isomerase to chromosome 7, and those for lactate dehydrogenase B and triosephosphate isomerase to chromosome 9.

Cytogenet. Cell Gent. 31, 184-187, 1981.
2 tables, 1 fig., 12 references.
In English. Authors' abstract.

CYTOGENETIC INVESTIGATIONS IN FARM FUR-BEARING ANIMALS. II. G-BAND PATTERNS IN COYPU CHROMOSOMES. (MYOCASTOR COYPUS, RODENTIA, CAPROMYIDAE).

Agripina Lungeanu, I. Voiculesou, N. Avram, The "Pasteur" Institute for Veterinary Research and Biological Products, Bucharest, Roumania.

Belonging to the fur-bearing animals, coypu is one of the most common farm species. It is known that, led into captivity, like other fur-bearing species, coypu displays fertility and prolificity disorders, as well as embrionary mortality. It is obviously necessary to establish an uniform interpretation of the cytogenetical changes corresponding to the above mentioned perturbances.

FREGA (1966) and TSIGALIDOU (1966) studied by means of classical staining the normal coypu karyotype.

The G-banding characterization of the normal karyotype in coypu chromosomes makes the subject of the present paper.

4th Eur. Colloq. Cytogenet. Domest. Anim. 1980, pp. 412-418.
3 figs., 5 references. Authors' abstract.

ROBERTSONIAN TRANSLOCATION IN ARCTIC FOX/ALOPEX LAGOPUS/ AND ITS EFFECT ON FERTILITY.

Marek Switonski, Inst. of Animal Breeding and Production Technology, Academy of Agricultural, Wolynska 33, 60-637 Poznan, Poland.

In the karyotype of arctic fox /Alopex lagopus/ there are two pairs of acrocentric chromosomes which take part in Robertsonian translocation. The occurrence of this chromosome aberration in this species was observed by GUSTAVSSON /1965/. The preliminary investigations carried out by SWITONSKI /1979/, and MÄKINEN and GUSTAVSSON /1980/ showed that this

aberration occurs in the arctic fox population much more frequently than in other species.

4th Eur. Colloq. Cytogenet. Domest. Anim. 1980, pp. 45-49.
3 tables, 7 figs., 4 references. Author's summary.

ROBERTSONIAN TRANSLOCATION IN THE BLUE FOX (ALOPEX LAGOPUS) AND ITS EFFECT ON THE FERTILITY.

Marek Świtoński, Inst. of Animal Breeding and Production Technology, Academy of Agriculture, ul. Wolyńska 33, 60.637 Poznań, Poland.

The present cytogenetic studies covered 401 individuals from two farms of fur-bearing animals. As a result of the performed analysis of the karyotype of the blue fox (chromosome measurements, G-bands), the karyotype model of that species has been proposed. The studied population was found to have karyotype polymorphism induced by robertsonian translocation, as well as individuals with the diploid numbers of chromosomes: 50, 49, 48. These forms occurred at the frequencies of 26.9%, 47.9% and 25.2%, respectively. The effect of Robertsonian translocation on the fertility of animals was studied by comparing reproduction results obtained from different types of mating. The type of mating was determined basing on the chromosome number in male and female. The obtained results showed that females with the diploid chromosome number equal to 48 gave larger litters. On the other hand, results obtained for 49-chromosome females were not unbiased. No effect of the male karyotype on the fertility was found.

Genetica Polonica, Vol. 22, 1981, no. 4.
5 tables, 8 figs., 36 references. Author's summary.

BANDING ANALYSES OF THE SOMATIC CHROMOSOMES OF RACCOON DOGS; NYCTEREUTES PROCYONOIDES, FROM FINLAND.

Auli Mäkinen, Karl Fredga, Institute of Genetics, University of Helsinki, P. Rautatiekatu 13, SF-00100 Helsinki 10, Finland.

The chromosomes of the raccoon dog, Nyctereutes procyonoides Gray, 1834 (Canidae, Carnivora, Mammalia) were first described by the Japanese scientist Minouchi (1929), on sections from testis of one specimen under the synonymous name Nyctereutes viverinus. The chromosome number was determined to 2n=42, and this number was later confirmed by Tsuchiya and Yoshida (1971). Wurster (1969) and Todd and Pressman (1969) also found 2n=42 in a few animals, most likely descendants of Japanese raccoon dogs, and pointed out that the majority of chromosomes were metacentric or submetacentric. From these investigations it is clear that the karyotype consist of 13 pairs of m-sm and 7 pairs of t autosomes. The X chromosome is the largest of the acrocentric and the Y chromosome is a small satellited acrocentric. The NF (nombre fondamental) is 68 and the NFa (nombre fondamental autosomique) 66. An acrocentric X chromosome is unique among the many species of Canidae studied, and in fact, among all Carnivora in which the X chromosome as a rule is metacentric. Wurster (1969) pointed out that the karyotype of the raccoon dogs isunique.

Both wild and farmbred raccoon dogs in Finland originately come from Russia. They have 2n-56 with the majority of their chromosomes acrocentric (Mäkinen 1974, 1975). The karyotype consist of 5 pairs of m-sm and 22 pairs of t autosomes. The X chromosome is medium-sized and metacentric and the Y is by far the smallest chromosome of the karyotype and has satellites. Accordingly, their NF value is 68 and their NFa value 64. Among the 42 raccoon dogs studied from different farms in Finland, 1 was a chromosomal mosaic (Mäkinen 1975).

The present study was undertaken in order to deepen our knowledge of the raccoon dog karyotype by mens of several banding techniques, thus making possible a future detailed comparison between the 42 and 56 chromosome karyotypes. Most of the autosome pairs in the raccoon

dog are indistinguishable from another in unbanded chromosome preparations, but after G-banding every chromosome pair can be identified.

4th Eur. Colloq. Cytogenet. Domest. Anim. 1980, pp.420-430.
6 figs., 1 table, 17 references. Authors' introduction.

CENTRIC FUSION POLYMORPHISM AND SIZE HETEROMORPHISM IN THE KARYOTYPE OF THE BLUE FOX (ALOPEX LAGOPUS).

Auli Mäkinen, Ingemar Gustavsson, Dept. of Genetics, University of Helsinki, P. Rautatiekatu 13, SF-00100 Helsinki 10, Finland.

Investigation of blue fox (Alopex lagopus L.) chromosomes by means of new banding techniques has revealed the existence of large, conspicuous heterochromatic segments in ten chromosome pairs, and size heteromorphism in one of them. A widespread and presimably ancient polymorphic system of centric fusion type was identified.

4th Eur. Colloq. Cytogenet. Domest. Anim. 1980, 398-405.
1 table, 3 figs., 18 references. Authors' summary.

THE HETEROCHROMATIN VARIATION IN THE FINNISH RACCOON DOG.

Auli Mäkinen, University of Kuopio, Finland.

Heterochromatin is a kind of genetically inactive chromosomal substance. The Finnish raccoon dog, 2n=56, has normally heterochromatic centromere regions and besides of that one completely heterochromatic pair of chromosomes.

An extra fully heterochromatic chromosome is, however, quite common in phenotypically normal raccoon dogs. This extra, genetically inactive chromosome appears either in all cells or only in some of them in so called mosaic structure, whereas the amount of genetically active substance, euchromatin, is the same as in normal raccoon dogs.

In the two species of raccoon dogs: the Finnish raccoon dog,, 2n=56, and the Japanese raccoon dog, 2n=42, should the euchromatin parts of the chromosomes be similar to each other in order to make the breeding between species possible. The difference in the amount of heterochromatin is without importance in regard to offspring from matings between near related species.

Variation in the amount of heterochromatin is quite common in question of near related species and it has an important role in the evolution of species.

Report from NJF's congress in Ålesund, Norway, 1982.

Author's abstract.

THE INFLUENCE OF VARIATION IN THE NUMBER OF CHROMOSOMES ON THE LITTER SIZE OF BLUE FOX.

Auli Mäkinen, University of Kuopio, Finland.

An important factor in productive fur farming is a good litter size. The variation between farms in great duet to different environmental conditions. On the other hand the genetical differences between farms are less due to an effective exchange of breeding stock between producers.

The genetical factors (genes) are located in the chromosomes. The number and the form of the chromosomes is fixed within the species. Structural changes in chromosomes are, however, an important part of evolution.

Such a variation in the number of chromosomes caused by structural changes is quite common in the farm bred blue fox population. Approximately half of Finnish blue foxes have 2n=49, the remaining half beeing divided equally between types 2n=48 and 2n=50.

In the animals with 2n=49, who have a structurally abnormal chromosome inherited only from one of the parents, in meiosis some of the gametes

end up with too much or too little genetic material. In such case the fertilized egg has an unbalanced combination of genes and its development is ceased at an early embryonal stage.

If the structural change in chromosomes is inherited from both parents, 2n=48, does such unbalance between gametes not occure and the litter size is normal.

Investigations carried out on a big Finnish blue fox farm have confirmed that in mating combinations where the male and female are of type 2n=49 the litter size is significantly smaller than if both parents are of type 2n=48 or 2n=50. The results agree with respective investigations in other countries.

Report from NJF's congress in Ålesund, Norway, 1982.

Author's abstract.

THE CHROMOSOMES OF EURASIAN BEAVER /CASTOR FIBER, L./ FROM THE PASLEKA RIVER, POLAND.

P.S. Sysa, W. Zurowski, Dept. of Histology and Embriology, Inst. of Animal Physiology, Faculty of Veterinary Medicine, Warsaw Agric. University, 02-766 Warszawa, Poland.

From earlier reports of HSU and BENIRSCHKE /1968/, GENEST et al. /1979/ and LAVROV and ORLOV /1973/ it appeared that Canadian beaver /Castor canadensis acadicus/ has karyotype 2N=40. Eurasian beaver, that is C. fiber vistulanus, Matschie, C. fiber pohlei, Serebr. or living on the Elba river C. fiber albicus, Matschie has 2n=48, as reported by LAVROV and ORLOV /1973/ and ZERNAHLE and HEIDECKE /1979/. The difference in the number of chromosomes is due to the fact that in Canadian beaver all chromosomes are meta- og submetacentric. In Eurasian beaver: meta-, submeta- and acrocentric chromosomes appear, the latter ones in the number 8 pairs. However, NF is always 80.

4th Eur. Colloq. Cytogenet. Domest. Anim. 1980, pp 432-436.
4 figs., 1 table, 8 references. Abstract by G. Jørgensen.

CONTRIBUTION TO THE PHYSIO-PATHOLOGIC STUDY OF THE REPRODUCTION OF MINKS.
THESIS FOR THE PhD IN VETERINARY.

ECOLE NATIONALE VÉTÉRINAIRE DE TOULOUSE
ANNÉE 1981 N° 108

CONTRIBUTION A L'ÉTUDE PHYSIO-PATHOLOGIQUE DE LA REPRODUCTION DU VISON D'ELEVAGE

THÈSE

POUR LE DOCTORAT VÉTÉRINAIRE
DIPLÔME D'ÉTAT

présentée et soutenue publiquement en 1981
devant l'Université Paul-Sabatier de Toulouse
par

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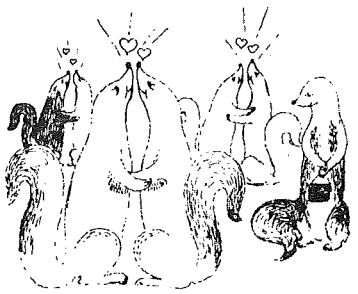
The mink is a species with seasonal reproduction which may present one or more oestrus in the course of the season. It s most noticeable

characteristics is the variable duration of the gestation. The dealyed nidation linked to luteal inactivity is influenced by external stimulus, the light being the most important, and internal stimulus, of not clearly understood nature.

The light has also influence on the male reproductive activity, i.e. the development of the testes is a retarded response to the "lengthening" of the days, under the condition that the winter fur will be developed. In the female, the light induced receptivity to the male has not yet been demonstrated although this experimental finding is expected.

Besides the introduction, conclusions and bibliography, the thesis is compared of three chapters:

I. Anatomy of the genital apparatus.
II. Physiology:
   a. Seasonal variations,
   b. Ovulation,
   c. Fecunidation.
   d. Development at the yellow body,
   e. Implantation.
III. Patholoty.



10 figs., 3 tables, 83 references. Abstract by Nelly Blumenkrantz.
Thesis in French. 76 pp.

BIOLOGY OF THE FEMALE REPRODUCTIVE TRACT OF THE MINK MUSTELA VISON SCHREEBER, 1777.
I. MORPHOLOGY OF THE ENDOMETRIUM DURING ANESTROUS.

(Zur Biologie der weiblichen Reproduktionsorgane des Nerzes, Mustela vison Schreber, 1777.
I. Morphologie des Endometriums im Anoestrus).

Lüder C. Busch, Abt. Anatomie der Medizinischen Fakultät der Rheinisch-Westfälischen Technischen Hochschule, Melatener Strasse 211, D-5100, Aachen, BDR.

The mink uterus (corpus uteri and cornua uteri) during anestrous was examined by SEM and TEM.

The endometrium of the uterine horn forms 5 longitudinal mounds and a sequence of circularly arranges mucosal pillows on the antimesometrial side of the horn. Up to 8 longitudinal mounds, however, may appear in the corpus uteri.

The epithelial cells of the endometrium are characterized by extended depots of glycogen, sometimes disintegrated by electronopaque areas. Numerous elongated mitochondria are located particularly in the supranuclear region. Cisternae of the rough endoplasmatic reticulum are rare. Golgi bodies are not very prominent. Small secretory granules of different structure are located particularly in the supranuclear region. During late anestrous, however, these granules occur in the apical cell region. Other characteristic organelles of the endometrial epithelium are lamellar bodies of varying size, shape and structure. Possibly they are lysosomelike deposits of phospholipids. Up to now development and function of these lamellar bodies are unknown. Ciliated cells are rarely seen during anestrous. Light cells with dendritic processes - similar to the cells of Langerhans - are also visible among the columnar epithelial cells.

The uterine gland cells are nearly free of glycogen and lamellar bodies. But secretory granules of varying size do exist during the whole anestrous.

Anat. Anz., Jena 148, 1980, 14-29.
10 figs., 48 references. Author's abstract.
In German with abstract in English.

EFFECT OF GENOTYPE ON DEVELOPMENT OF MINKS DURING THE EARLY EMBRYONAL PERIOD.

D.K. Belyaev, G.K. Isakova, G.G. Nazarova, Inst. of Cytology and Genetics , Siberian Division of the Academy of Sciences of the USSR, Novosibrisk.

It is known that in mammals the majority of embryonal losses occurs before or at the moment of implantation.

We demonstrated earlier that minks of different colors are characterized by different levels of embryonal viability and that 80 to 90% of all embryonal losses occur during the preimplantation period. Specifically, sharp differences were noted in frequency of preimplantation mortality in standard (wild type) and sapphire minks (mutants with respect to fur color); approximately 34% and 60% respectively. In conjunction with this the question arose as to whether there are differences in rates of development and in frequency of embryo loss in different genotypes during early embryogenesis. The purpose of the present work was a morphological and cytological analysis of embryos of standard and sapphire minks during early embryonal periods.

Two-year old minks that had produced from one to seven pups during the preceding breeding season were selected. The average number of offspring per litter was the same for the standard and sapphire females, but actual fertility in sapphire minks was substantially lower because of the high level of early postnatal losse maong the progeny.

The females were exposed to males once during a period from 4 to 14 March, 1980, for 9-11 h. Some embryos were analyzed 5 days and some 7 days after mating.

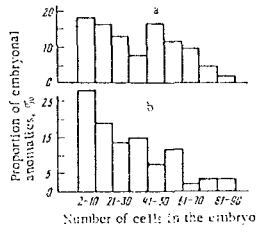


Fig. 1. Distribution of embryos according to number of cells in standard (a) and sapphire (b) minks 7 days after mating

In the sapphire minks it is apparent 7 days after mating that there is a significantly greater proportion of embryos at the stage of 2-10 blastomeres, and the standard minks are generally more advanced in development.

The date obtained do not lead to the conclusion that there is a genetic control for rate of division. It is known that induced ovulation is characteristic for minks and may take place several hours after mating. A typical feature of mutants, particularly sapphire minks, is a retardation of ovulation by an average of 6-8 h beyond that of the wild type.

From this we may assume that in comparison with the standard the delay in development in sappire minks is the result of delayed ovulation, which leads to a delay in fertilization and a later initiation of zygotic division. As a whole the results of the investigation lead to the conclusion that in mutant minks the frequencies of anomalies in oogenesis and of disturbances in processes of fertilization are increased, and that there is a delay of the first reduction division in comparison with minks of the wild type.

Translated from Doklady Akademii Nauk SSSR, Vol. 260, No5, 1251-1253, October 1981. - 0012-4966/81/0910-0460$7.50 1982 Plenum Publ. Corporation.
3 tables, 1 fig., 10 references. Abstract by G. Jørgensen
In English.

ULTRASTRUCTURE OF THE PINEAL GLAND OF THE MINK (MUSTELA VISON).

D.M. Rouvet, c/o Dr. C.C. Capen, Dept. of Veterinary Pathobiology,
The Ohio State University, 1925 Coffey Rd., Columbus, OH 43210.

The pineal gland of the mink (Mustela vison) was examined, using light and electron microscopy. Its cellular structure was compared with that of the pineal gland in other mammalian species, including that of a close taxonomic relative, the ferret.

The pineal gland of the mink was composed of pinealocytes and neuroglial cells, as well as numerous neuron cell processes and nerve endings, whichprovide extensive neural input to the pineal gland. A high degree of vascularity, extent of neural innervation, pinealocyte organelles, and presence of extensive pinealocyte processes with secretory granules indicate an active secretory function. This secretory function is postulated to be associated with the onset of the yearly reproductive cycle in the mink.

Am. J. Vet. Res., Vol. 43, no.8, 1492-1496.
7 figs., 36 references. Author's summary.

CIRCADIAN PHOTOSENSITIVE PHASE AND PHOTOPERIODIC CONTROL OF TESTIS ACTIVITY IN THE MINK (MUSTELA VISON PEALE AND BEAUVOIS), A SHORT-DAY MAMMAL.

L. Boissin-Agasse, J. Boissin, R. Ortavant, Ctr. d'Etudes Biologiques des Animaux Sauvages, C.N.R.S., Villiers-en-Bois, 79360 Beauvoir-sur-Niort, France.

Evidence of a circadian photosensitive phase in male mink, whose annual productive cycle is characterized by the recrudescence of testicular development in autumn, was based on the study of testicular response after interrupting the dark period by light breaks (0.5 h) offered at various times. In this mammal, the experimental short days 4L:20D and 8L:16D stimulated testicular growth. Short photoperiods, including a main light period of 3.5 h and an additional 0.5 h light break 7.5 h after the beginning of the main photoperiod, were as effective as 8L: 16 D in stimulating testicular development. On the other hand, when a 0.5 h light break occurred 11.5 or 15.5 h after the beginning of the main photoperiod, the same inhibiting effect of testicular activity was obtained as for long photoperiods. However, when 0.5 h light breaks were given 19.5 h after the beginning of the main light period, some minks recognized, as "dawn", the onset of the shorter of the two light period offered.

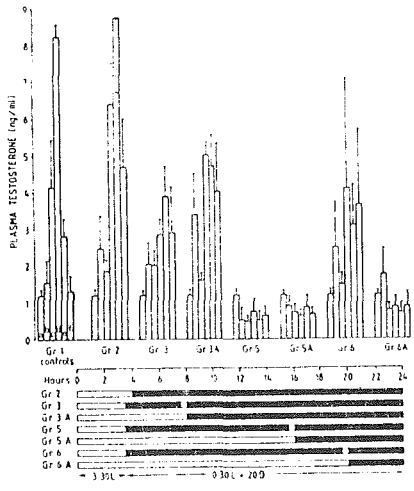


FIG. 5 Influence of daylength on testosterone secretion in the mink. The plasma testosterone levels obtained for the animals under 8L:16D, 16L:8D, and 20L:4D were compared with those measured when an additional short photoperiod (0.5 h) interrupted the dark period. Animals in group 1 were maintained under natural environmental conditions. Six minks per group were used. Vertical bars represent SEM. a, Beginning of the experiment. b, 30 c, 60 d, 90. e, 120. and f, 150 days later.

Thus our results proved the existence of a special phase in the day cycle in which light inhibited testicular development in the mink which appears to be a short-day animal. One explanation of the difference between long-day and short-day animals would be the following: if for long-day animals exposure to light during the photosensitive phase led

to gonadostimulation, in short-day mammals, like mink, it exerted an inhibiting influence on testicular growth.

Biology of Reproduction, 26, 110-119, 1982.
5 figs., 33 references. Authors' abstract.

THE IMPROVEMENT OF PRODUCTION CHARACTERS OF STANDARD SABLE MINK.

N.M. Tsepkov, I.I. Shirotov, A.P. Volodkin, N.F. Derin, Petrozavodsk, USSR.

Sable mink were imported to the USSR in 1977. In the 1st year after importation, litter size was <3. Crossing with standards was subsequently carried out. In 1979, litter size averaged 4.08. From 1978 to 1979, the percentage of large pelts increased from 29.8 to 33.6 percent, and that of pelts free from defects from 19.9 to 33.8.

Referativnyi Zhurnal 1982, 1.58.559.
2 tables. CAB-abstract.
In Russian.

THE PINEAL GLAND AND PHOTOPERIODIC CONTROL OF THE FERRET'S REPRODUCTIVE CYCLE.

J. Herbert, Dept. of Anatomy, University of Cambridge.

This paper sets out to discuss how much we currently understand of the mechanisms by which changing photoperiods regulate the female ferret's breeding season, with particular emphasis on the function of the pineal.

Biological Clocks in Seasonal Reproductive Cycles, 261-176, 1981.
Publ.: Bristol, UK, Scientechnica.
6 figs., 30 references. Author's abstract.

PROSPECTS FOR THE ARTIFICIAL INSEMINATION OF SILVER-BLACK FOXES.

V.N. Pomytko, E.P. Bautina, Petrozavodsk, USSR.

Insemination with semen diluted 1:4 (the whole ejaculate) or 1:16 (the dense fraction) resulted in a cr. of 75.7 percent and a litter size of 4.4 plus or minus 0.5. For natural matings, the cr was 93 percent, and litter size averaged 5.7 plus or minus 0.5

Referativnyi Zhurnal 1982, 1.58.410.
In Russian. CAB-abstract.

CONTENT OF SEX STEROIDS IN THE BLOOD PLASMA OF FEMALE SABLE AT THE INITIAL STAGES OF POSTNATAL ONTOGENESIS.

N.K. Shul'gina, Yu. V. Polyntsev, V.B. Rozen, G.M. Diveeva, Scientific-Research Institute of Fur Raising and Rabbit Breeding, Rodniki, Moscow Province.

The sable is one of the representatives of the marten family that is an object of fur breeding. The developmental biology and reproduction of these animals has many interesting pecularities: a rather late entry into the reproductive period (at two to three years of age), comparatively low average fertility of the females, prolonges diapause of pregnancy, etc.

Until recently the dynamics of the sex hormones has been studied only in adult sable. At the same time, in our opinion, we can answer many questions associated with the reproduction of sable by studying the process of development of sexual maturation of the animals. One of the approaches to the solution of this problem may be an investigation of the dynamics of the sex steroids in the peripheral blood of the animals in the process of ontogenesis.

Since it is believed that female sable mature sexuality by 27 months, the purpose of our work was to determine the concentration of estradiol-17β (E_2), progesterone (P), and active androgens (A) by a radioimmunogical method, with the aid of the corresponding kits from CEA (France) in animals from 2 to 27 months of age (from June 1978 up to July 1980).

Our investigations showed that in June to July (in two- and three-month-old females) high values of the concentrations of steroid hormones in the blood plasma were registered. Then, at five months (September), a distinct and reliable peak of all the investigated groups of steroids is detected ($P > 0.95$). This increase in the hormone content can evidently be explained by a rather intensive growth and maturation of the structures of the ovary associated with hormone formation.

In February to March the content of steroids in the blood plasma increased significantly ($P > 0.95$) to values comparable with the September levels.

In July (during the period of heat in adult females), in 15-month-old animals the content of E_2 and P was high, quite comparable with the corresponding concentrations in the blood plasma of adult females.

The autumn-winter lowering of the levels of steroids in females in the second year of life occurs more stably and is more pronounced ($P > 0.99$) than in animals of the first year of life.

Possibly a change in the conditions of maintenance of the animals and/or their hormonal stimulation, beginning with five months of age, migth aid in effectively explaining their reproductive processes. On the other hand, the high secretory activity of the ovaries in virgin animals (at 15 months) is apparently evidence of an insufficient degree of maturity of the higher divisions of the hypothalamo-pituitary-gondal system as a whole in comparison with reproducing female sable.

Translated from Doklady Akademii Nauk SSSR, Vol. 258, No.6, 1504-1507, June 1981. - 0012-4966/81/0506-0255$07.50 - 1981 Plenum Publ.Corporation.
1 table, 7 references.
In English.

Abstract by G. Jørgensen

PRENATAL MORTALITY IN BLUE FOX AND STANDARD MINK.

Einar J. Einarsson, Dept. of Poultry and Fur Animal Science,
The Agricultural University of Norway, P.B. 17, N-1432 Aas-NLH, Norway.

The number of ovulated eggs in the female are the first factor determining the litter size, while the male primarily affect through the semens fertilizing capacity. In addition to high ovulation rate and high fertilization, the prenatal mortality must be low to give a large litter size at birth. The prenatal mortality will mainly depond on two factors, the liveability of the fetus (genmaterial from sire and dam) and the maternal environment of the fetus (maternal effects). Assuming that the fertilization of the ovulated eggs are normal, then the implantation ability of blastocyst will be of great importance for the liveability, especially in the mink with delayed implantation.

The difference between number of kits born and implanted fetuses will give an impression of the prenatal mortality. In fox and mink the number of implanted fetuses can be counted by looking at the implantation zones, which are remnants of the placenta (placenta zonaria, endotheliochorialis) in the uterus wall. The implantation zones were visuable as small dark spots in the uterus, where each spot correspond to an earlier implanted fetus.

In the blue fox the implantation zones will be visuable from about 17 days post coitum and therby cover 67% of the gestation period. The zones will be visuable until next heat which make it possible to look at the uterus at the time of pelting. In the mink the zones will be visuable about 23 days before parturition, which cover 60% of the gestation period, exclusive the period of delayed implantation. The zones in the mink will, however, be unclear to read short time after weaning.

The prenatal mortality during the last 35 days of gestation period was found to be 18% in the blue fox, while it was found to be 13.5% during the last 23 days of the gestation period in the mink. All exclusive stillborn kits. Almost 80% of the mink kits that were found dead at

first control (within 12 h.) were stillborn. There was found implantation zones in about 40% of the mated mink females which failed to give birth and the corresponding figure in the blue fox was 55%.

Stenciled report from NJF Scientific meeting concerning fur bearing animals, Ålesund, Norway, 1982. 13 pp.

2 tables, 2 figs., 19 references. Author's summary.

CONGRATULATIONS !

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Original Report.

THE PHYSIOLOGICAL EFFECT OF VARIOUS ACIDS ON MINK AND A COMPARISON BETWEEN NET ACID MEASUREMENTS VERSUS MEASUREMENT OF TITRABLE ACID.

Boguslav Barabasz* & Gunnar Jørgensen, National Institute of Animal Science, Trollesminde, 48 H Roskildevej, DK Hilleroed, Denmark.

*) Present address: Akademia Rolnicza Im. Hugona Kollataja, w Krakowie, Zaklad Hodowli Zwierzat Futerkowych, 30-059 Krakow Al. Mickiewicza 24|28, Poland.

SUMMARY.

Balance experiments with adult pastel mink females have been carried out over a period of 14 days with a view to measure the physiological effect in mink of variable amounts of acetic, formic, propionic, phosphoric and sulphuric acid.

The trials showed that propionic acid has a marked negative effect on the palatability of the diet, and that formic acid has a highly negative effect, while acetic acid and sulphuric acid had a detrimental effect only when used in large quantities. Phosphoric acid had only a slight effect on appetite.

Water intake in the experimental animals was independent of feed and acid intake.

Acid blance, measured on a net acid basis, showed that organic acids are metabolized in the body, while inorganic acids must be eliminated fully through faeces and urine.

Furthermore, the balance showed that on the basis of normal energy metabolism in the body mink have a basic acid excretion of 2-4 milliequivalents net acid per 24 hours per kg body weight. The relatively high net acid excretion in faeces, when inorganic acids are used in the diet, confirm the influence of these acids on the availability of minerals.

Blood acid-base balance and contents of inorganic phosphorus were not affected by the experimental treatments of the diets.

A comparison between the two methods - measurement of titrable acid and net acid - showed that both methods may be applied to diets but that only the net acid method can be applied in connection with measurement of acid balances.

Owing to the fact that results of measurements of titrable acid are high, dependent on type and quantity of acid used, the authors would recommend that all titrations connected with feed evaluation of fur animal diets be carried out as net acid titrations, as described by Jørgensen (1957).

Supplementation of mink feed with acid is not of recent date. Addition of phosphoric acid to lower urine pH and thus avoid formation of urinary calculus has been generally practised for many years (Leoschke, 1956; Hallinan, 1963; Jørgensen, 1966 & 1970, Jørgensen & Glem-Hansen, 1973. The most extensive use of acid has, however, been connected with preservation of mink feed or fresh animal feeds.

A short-term preservation of compounded mink feed has been achieved through addition of 0.2-0.4% acetic acid (80% concentration). Shortage of fresh animal feedstuffs has incurred, however, that mink farmers have switched to long-term preserved fish products, poultry offal, and blood, using inorganic and/or organic acids.

Acid preservation has been applied especially to trash fish, which is difficult to store when deep-frozen owing to the relatively high fat contents of these types of fish. In Denmark, this method of preservation has, in the main, been carried out through addition of sulphuric acid (2,6%), acetic acid (1.1%), and the antioxydant Etoxyquin (200 ppm).

Experiments as well as practical experience have shown that the above method of preservation results in a very high quality silage, both microbiologically and chemically. But owing to the very low pH value of 2.8-3.0, as well as the presence of sulphuric acid, use of the silage presents certain limitations. Feeding of even very moderate quantities during the intensive production periods - lactation and intensive kit growth - has caused metabolic acidosis and complications related thereto (Jørgensen, Poulsen & Bendixen, 1976; Poulsen & Jørgensen, 1976; Poulsen & Jørgensen, 1977 a,b), and the mineral balance may also be impeded (Hansen & Glem-Hansen, 1980).

It has, therefore, been considered of value to find alternative preservatives for the production of fish silage. In this connection various acids have been tested, viz. phosphoric acid, formic acid, propionic acid, and acetic acid. However, to ensure the best possible basis for an evaluation to the effects of these acids in mink feed, it is imperative to have a knowledge of their influence on:

1. Palatability of the feed.
2. The acid-base balance and blood contents of inorganic phosphorus.
3. Acid absorption and acid excretion.
4. Water intake.

With a view to assessing the above factors, an experiment was carried out in 1980 including variable amounts of acetic, formic, propionic, phosphoric and sulphuric acids in rations for adult female mink.

MATERIAL AND METHODS.

The experiment was carried out during the period 1st March to 1st June, 1980, and included 20 pastel mink females distributed over four groups of 5 animals (Groups A, B, C and D). Each experimental treatment lasted 14 days, of which 4 days were preparatory and 10 days the actual experimental period, as per the plan given in Table 1.

Table 1. Experimental plan showing period and group distribution and acid concentration of amounts of acids as well as milliequivalents (meq) net acid in diet.

Period	Acids added	Concentration % by weight	Concentration appr. normality	pH value of experimental diet 6.9 Group **	%	meq. *	5.8 Group **	%	meq. *	5.2 Group **	%	meq. *	4.6 Group **	%	meq. *
	Organic acids														
I	Acetic acid	80	14	A (1)	0	50	B (1)	0.4	68	C (2)	1.0	134	D (2)	5.0	523
II	Formic acid	85	26	D (4)	0	29	A (3)	0.3	54	B (3)	0.5	81	C (4)	1.2	164
III	Propionic acid	99	13	C (6)	0	29	D (6)	0.5	83	A (5)	2.0	185	B (5)	7.5	698
	Inorganic acids														
IV	Phosphoric acid	86	45	B (7)	0	32	C (8)	0.6	101	D (8)	1.0	140	A (7)	1.8	233
V	Sulphuric acid	96	36	A (9)	0	57	B (9)	0.3	79	C(10)	0.6	129	D(10)	1.0	168

*) Meq. indicates total net acid contents per kg diet.

**) Figures in brackets indicate week no. after start of experiment in which treatment was initiated.

As shown in Table 1, the individual groups have alternated between treatments, and this has affected results, especially in respect of feed intake.

The rations were compounded for the whole 14-day period of the experiment, weighed out in daily meals and stored at -20° C up to the day before use. Composition and nutrient contents are given in Table 2.

With a view to exact recording of feed and water intake as well as collection of faeces and urine, the animals were placed in special balance cages (Fig. 1) in a closed room and at a fairly constant temperature of about 16° C.

The day before use, the feed was removed from the deep-freezer to thaw out. After mixing the thawed out feed, the pH value was recorded - as well as net acid contents - in a representative number of samples prior to weighing out individual daily meals of 200 grams into plastic cups (Fig. 1). Remains of meals were weighed to enable exact recording of daily feed intake.

Table 2. Percentage composition and energy contents of experimental feed.

No.	Feed	%
1	Cod waste	45.0
2	Plaice waste	12.0
3	Offal, mix. from slaughterhouses	8.0
4	Fish meal	2.0
5	Blood meal	1.5
6	Soybean meal	1.5
7	Barley, ultra-heat treated	5.0
8	Wheat bran	2.0
9	Vitamin mix.	10.0
10	Lard	1.0
11	Water	12.0
I	Energy distibution, %	
	Protein	48.0
	Fat	35.0
	Carbohydrates	17.0
II	g dig. protein|100 kcal	10.6
III	kcal metabolizable energy|100 g diet	128

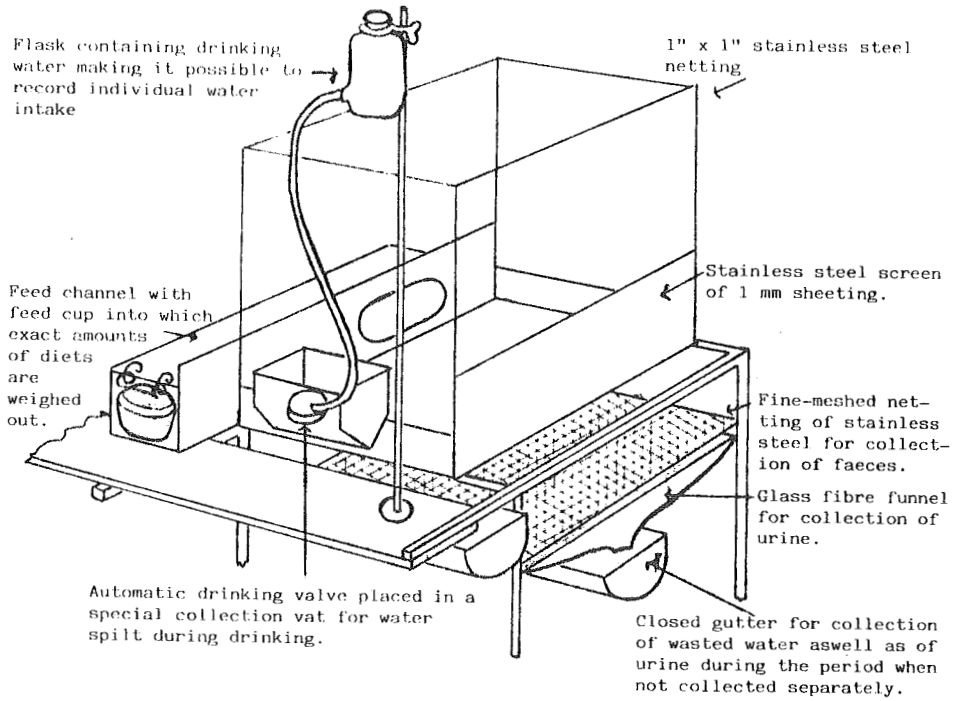


Fig. 1. Balance cage of stainless steel for mink ensuring full control of feed and water intake and reliable collection of faeces and urine.

Under titration control the feed was adjusted for each acid to the various pH values. As shown in Table 1, this procedure has incurred a large difference in the titrated amount of acid (meq/kg) for the various acids at the same pH value. This fact must be taken into consideration when evaluation the results of the experiment.

The animals had access to deionized water from a bottle (Fig. 1). This enabled individual water intake to be recorded.

Whilst feed and water intakes were recorded daily during the 10-day experimental period, urine and faeces were weighed and titrated four times during the experimental period, viz. on the 6th, 8th, 12th and 14th day after the start of feeding experimental rations.

Blood samples for analysis of the acid-base balance and inorganic phosphorus in periods II to V were taken from anaesthetized animals (24 mg Althesin^{R}|kg i/p) at the end of each experimental period.

Both pH measurements and titrations were carried out on a pH-meter manufactored by Messrs. Radiometer, Copenhagen, Denmark. While pH values were measured direct in feed, faeces and urine, titrations were carried out on filtrations of feed, faeces and urine. Net acid titration was performed according to the method described by Jørgensen (1957).

Net acid titration comprises both hydrogen ions (acid) buffered with ammonia (NH_3) and other buffer system such as hydroxy-ions (base), in the main buffered with bicarbonate (HCO_3-), in that they are released through boiling of acid and addition of formaldehyde which can be measured by titration on an equal footing with other acids or bases.

To compare results of net acid titrations with results of the ordinary method by which the amount of titrable acid or base is determined leaving out of account the part bound in the buffer systems, parallel measurements of titrable acid were carried out on a number of feed, faeces and urine samples. In all cases titration was continued to pH 7.4.

The acid-base status in blood samples was determined by the micromethods and graph-monogram described by Siggaard-Andersen (1962). The analyses were carried out at the Fur Animal Department Laboratory, Hilleroed, on BME 22 Micro Equipment manufactured by Messre. Radiometer, Copenhagen,

and within four hours of sampling. Inorganic phosphorus was determined according to Roche Diagnostica 0-1023/B in a spectrophotometer at 570-680 nm using Hg filter No. 578.

RESULTS AND DISCUSSION.

As shown i Table 1, supplementation with the individual acids varied considerably in order to obtain the planned pH values in the feed. This has meant that net acid contents, measured in milliequivalents (meq) per kg, were very inconsistent from one acid to another. The most marked variation was found at the lowest pH value.

Feed intake, as shown in Fig. 2, has apparantly been dependent on amounts of acid in the feed more than the actual pH value. As the limited number of animals included in the trial has incurred that the same animals have received different treatments during the experimental period, feed intake must be assessed with the proviso that a certain form of compensatory feed intake has taken place during the period following one in which the animals had a very low feed intake. This is especially marked for Group D during period II and for Group B during period IV.

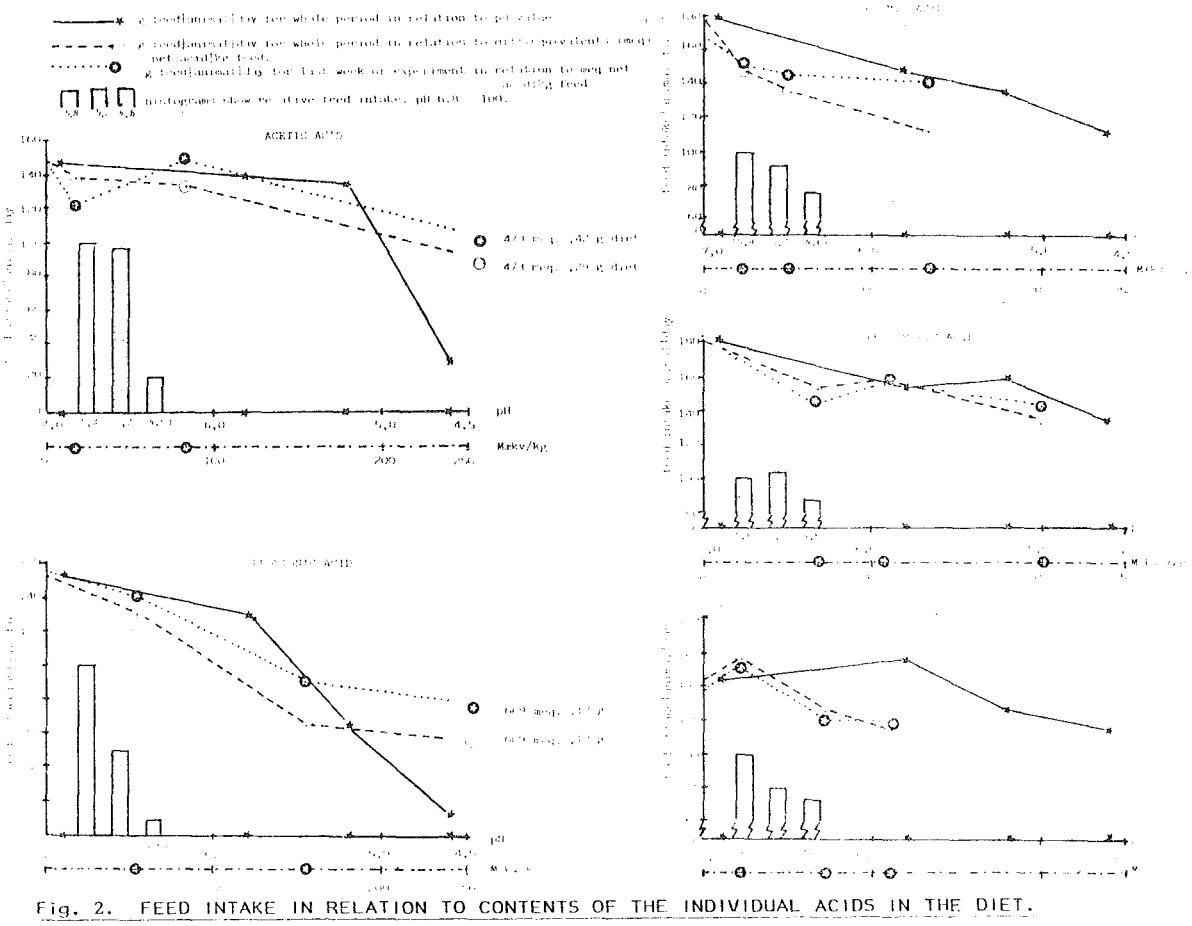


Fig. 2. FEED INTAKE IN RELATION TO CONTENTS OF THE INDIVIDUAL ACIDS IN THE DIET.

It has, therefore, been difficult to obtain a true picture of the influence of treatment on the palatability of the rations. Whereas the graphs show actual feed intake, the histogram is an expression of feed intake in relation to the group fed rations with minimum acid supplementation. An attempt has thus been made to eliminate the compensatory intake owing to low intake during the previous period.

On the basis described, it may be assumed that acetic acid only has a slightly negative influence on palatability of the ration at admixtures above 1%, while large amounts (5%) have a fatally detrimental effect. Propionic acid affected palatability negatively, irrespective of quantitites added. Also formic acid had a negative effect on palatability in all amounts tested. The difference in feed intake through the period and in the last week of the trial indicated, however, that a certain adaptation to feed containing formic acid is possible. Phosphoric acid has only had a slight effect on palatability of the rations, whereas sulphuric acid had a more pronounced detrimental effect on palatability.

Water intake was measured at 123 ml per animal/day on average, but with great variations. Considerable individual differences were found and these had no connection with feed intake and amounts of acid in the feed.

URINE pH VALUES.

Owing to the fact that titrations were to be carried out on urine produced over 24 hours, urine was collected quantitatively over 24 hours without precautions to avoid microbial or enzymatic changes during storage. This has meant that the pH-measurements reflect irrelevant conditions and cannot be taken as an expression of the actual pH value of the urine on excretion. Thus the pH-values found cannot be compared with results previously published (Leoschke, 1956; Hallinan, 1963; Jørgensen, 1966, 1970), in which determinations were carried out on fresh urine.

Both the pH variations due to type of acid and amount of acid are shown in Table 3. The variations in urine pH after feeding of neutral rations (pH 6.8) stress that no importance can be attached to the figures in relation to influence of urine pH of the various types and amounts of acids.

Table 3. Actual and relative pH value of urine (Normal = 100).

Diet/acid	Acetic acid		Formic acid		Propionic acid		Phosphoric acid		Sulphuric acid	
pH	av.	rel.	av.	rel.	av.	rel.	av.	rel.	av.	rel.
Normal	7.1	100	7.2	100	8.8	100	7.1	100	7.5	100
5.8	7.2	101	6.9	96	8.8	100	6.5	91	6.9	92
5.2	6.9	97	6.7	94	8.4	95	6.2	86	6.3	84
4.6	6.4	90	6.6	90	7.2	82	6.2	86	6.2	83

The reason for the results to be published is that it may be assumed that these changes in the urine also influence the amount of titrable acid and thus disturb the relations between titrable acid and net acid as shown in Table 4 and Fig. 3.

Table 4. Results of measurements of titrable acid and net acid (meq. per animal/24 hours).

Acid	Diet pH	Diet		Urine		Faeces		Acid Balance	
		Titr. acid	Net acid	Titr. acid	Net acid	Titr. acid	Net. acid	Titr. acid	Net. acid
Formic acid	6.8	4.08	4.90	0.71	7.41	1.36	1.69	+2.00	-0.83
	5.8	8.87	9.05	1.32	11.04	1.39	2.27	+6.16	+0.28
	5.2	10.70	12.89	1.32	8.50	1.28	1.73	+8.10	+6.12
	4.6	15.11	23.01	1.68	12.03	1.04	0.12	+12.39	+10.86
		r = 0.97		r = 0.86		r = 0.97		r = 0.95	
Propionic acid	6.8	2.77	4.96	2.30	7.44	1.67	0.46	-1.20	-2.95
	5.8	8.42	11.81	1.95	5.11	1.91	1.19	+4.57	+7.90
	5.2	17.22	16.36	5.02	7.80	1.97	2.32	+10.24	+10.41
	4.6*	-	-	-	-	-	-	-	-
		r = 0.97		r = 0.68		r = 0.90		r = 0.92	
Phosphoric acid	6.8	1.70	6.00	1.00	8.78	0.86	4.45	-0.16	-7.23
	5.8	7.39	16.64	3.22	14.49	2.44	4.14	+1.73	-1.99
	5.2	11.32	22.31	5.20	21.78	1.86	5.34	+4.26	-4.80
	4.6	17.53	28.21	12.04	36.50	0.81	5.29	+4.68	-13.58
		r = 0.99		r = 0.99		r = -0.38		r = -0.41	

*) Owing to very low feed intake the group has been left out of account in the calculations.

r = correlation coefficient.

It should be stated that such an experiment must be based on fresh urine or urine preserved in such a way that changes detrimental to the results of determinations do not occur during the collection period.

NET ACID VERSUS TITRABLE ACID.

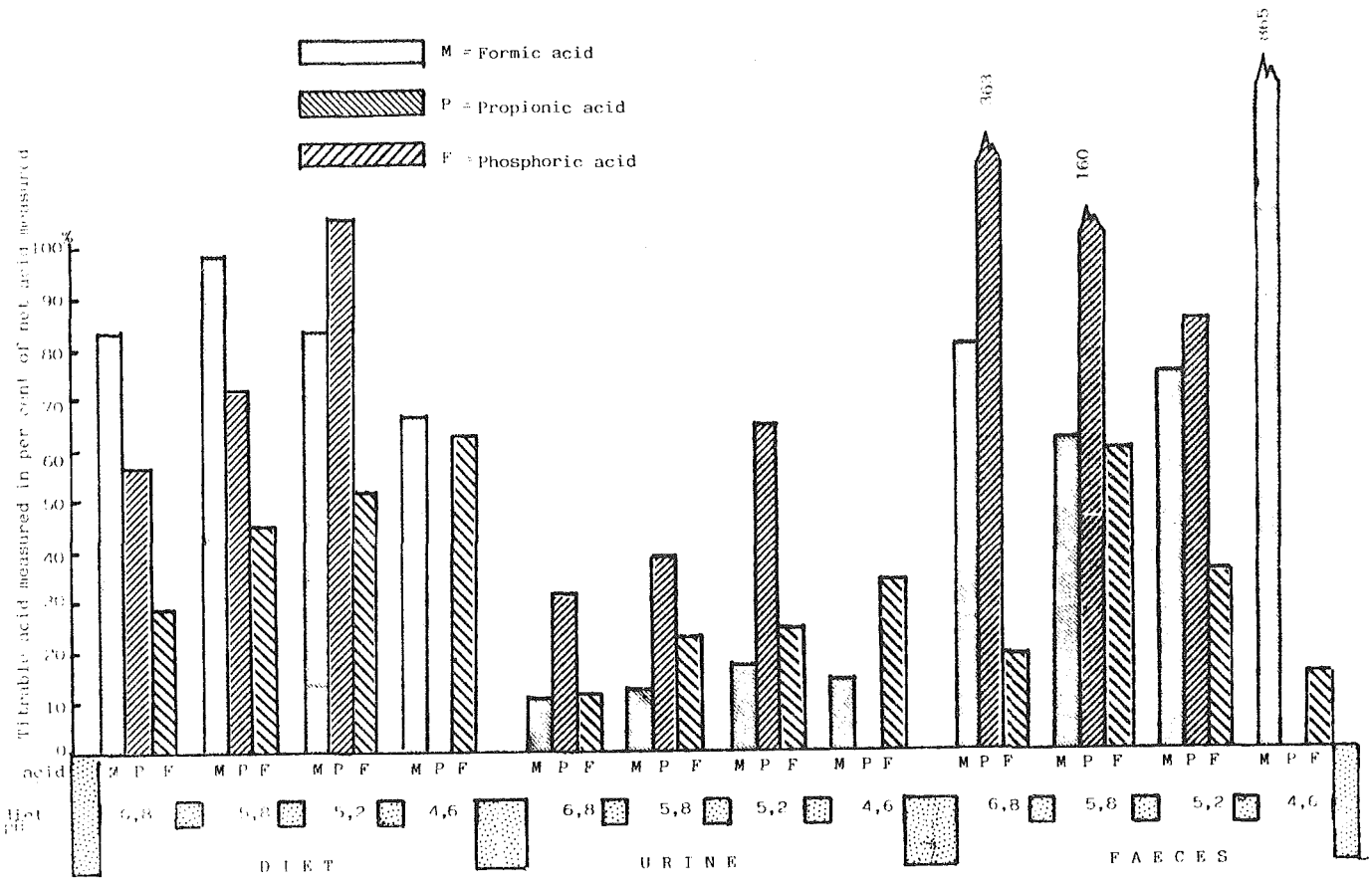
In most reports on experiments on acid load in fur animals only the pH value of the feed has been given. As the dissociation of the various acids is highly different, the feed pH value as such is a poor expression of the acid load to which the animal is exposed.

The Feedsuffs Committee under the Nordic Agricultural Research Association Sub-section for Fur Animals has, therefore, proposed the use of contents of milliequivalents tirable acid per kg feed dry matter as an expression of the acid load. (Titration with NaOH to pH 6.4).

To gain an impression of the differences between results of net acid titration and titrable acid, both feed, faeces and urine were titrated according to both methods (end pH-value 7.4) for one day in the experiments with formic acid, propionic acid and phosphoric acid.

Results of determinations are given in Table 4 and Fig. 3.

Fig. 3 Measured titrable acid in per cent of net acid measured.



The results indicate a high correlation between the two titration methods in respect of dietary titration, but that the levels depend on both amount and type of acid used.

As to differences in level and correlation between titrable acid and net acid measured in urine and faeces, it has been clearly demonstrated that titrable acid is a method that cannot be used for measurements of acid balance.

It must be considered highly important that the titration method is standardized in such experiments, as it will otherwise be difficult to compare results.

As net acid titration, described by Jørgensen (1957), is the only applicable method for determination of the acid balance and thereby offers a direct route to describe the prospects of elimination of acids supplied in feed, it is proposed that future feed titrations be carried out according to this method.

ACID BALANCE.

The acid turnover in the animals, as measured on the basis of net acid, is shown i Table 5 and Fig. 4, which show that organic acids are metabolized in the body and consequently do not stress kidneys, while inorganic acids must be eliminated through urine.

Table 5. Milliequivalents (meq) net acid absorbed and excreted during the different experimental treatments.

Acid	Feed pH	Acid in diet meq. absorbed animal/day	Acid in urine meq excreted animal/day	Acid in faeces** meq- excreted animal/day	Balance ***
Acetic acid *	6.8	7.17±1.71	8.74±3.52	1.65±2.72	-3.22±4.13
	5.8	9.18±2.47	7.87±2.28	0.62±2.73	0.68±3.08
	5.2	19.51±5.17	7.49±1.89	-0.09±1.30	12.62±4.28
Formic acid	6.8	5.11±0.78	7.86±0.97	-0.78±1.61	-1.98±1.77
	5.8	7.68±1.30	9.26±2.49	-1.73±1.75	0.23±2.72
	5.2	11.40±1.66	8.31±1.10	-1.74±1.35	4.82±2.10
	4.5	16.69±6.17	9.69±2.38	-0.13±0.77	7.14±5.65
Propionic acid *	6.8	4.64±0.69	6.72±1.42	0.88±2.24	-2.96±2.57
	5.8	11.48±2.46	5.51±1.39	-0.48±1.67	6.45±1.74
	5.2	13.43±6.62	6.24±2.42	-1.08±1.45	8.27±7.02
Phosphoric acid	6.8	6.10±0.72	7.95±2.68	3.76±2.57	-5.61±3.52
	5.8	16.07±2.35	14.68±1.90	3.56±2.59	-2.17±1.90
	5.2	21.91±3.46	21.34±4.13	4.85±1.63	-4.28±3.02
	4.8	31.44±8.41	31.03±13.08	7.81±3.66	-7.40±10.44
Sulphuric acid	6.8	7.76±1.74	8.10±1.70	3.73±2.08	-4.08±3.34
	5.8	12.62±2.08	11.70±1.66	3.66±2.59	-2.74±1.92
	5.2	16.15±3.03	15.46±2.42	3.78±1.97	-3.08±3.51
	4.5	21.78±4.54	19.75±4.64	4.06±1.39	-2.03±5.69

*) Owing to insufficient feed intake the pH group 4.5 has been left out of account for acetic and propionic acid.
**) Negative values indicate excretion of base.
***) Negative figures indicate that more acid equivalents were excreted than absorbed. Positive figures indicate that less acid was excreted than absorbed.

The results indicate a basic acid excretion of -4 meq. net acid per day in connection with normal nutrient metabolism and neutralization regulation in mink females weighing about one kilogram.

The explanation to the effect of inorganic acids on mineral uptake is seen in the fact that part of these acids is also neutralized and bound in the gastro-intestinal tract, after which they are excreted with faeces.

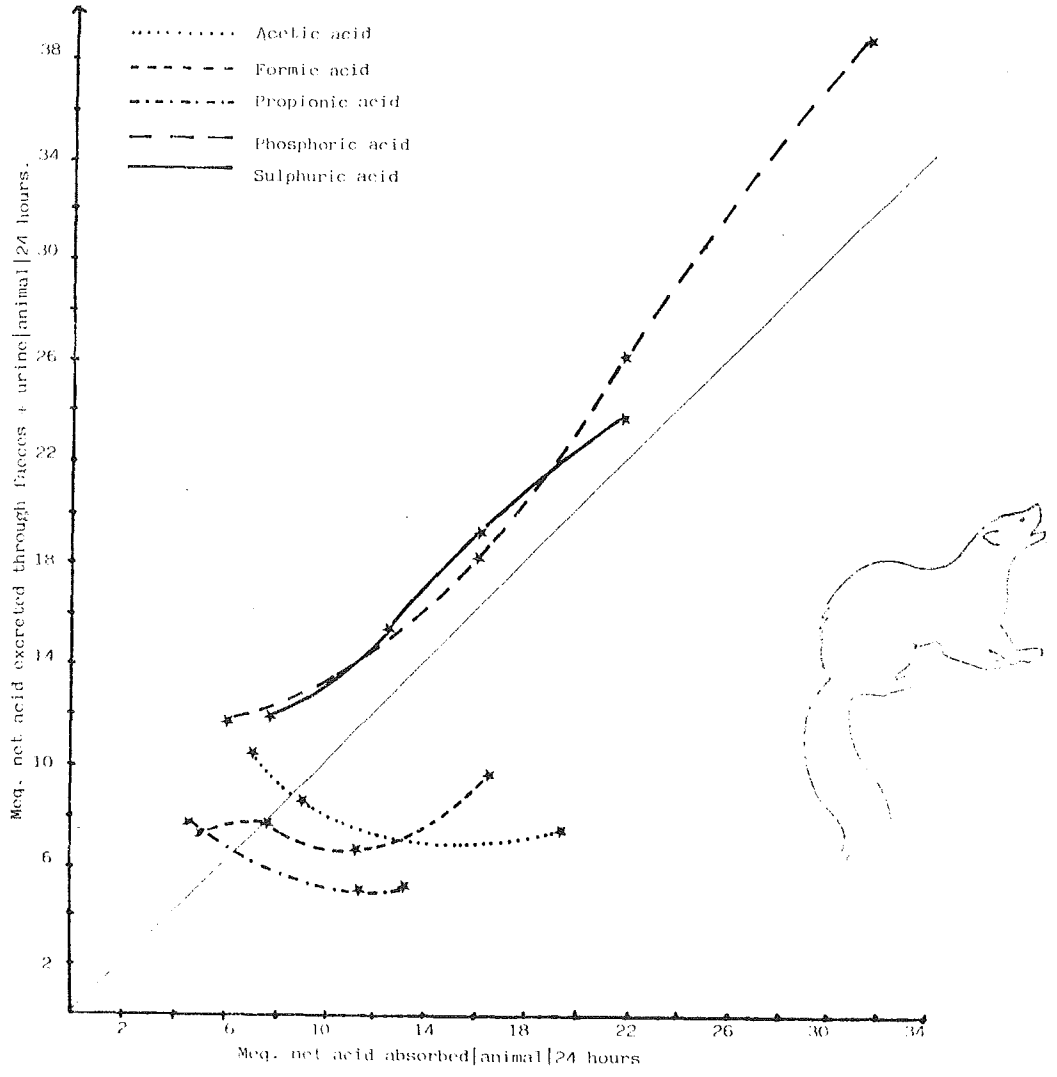


Fig. 4. NET ACID EXCRETION IN RELATION TO INTAKE.

BLOOD ACID/BASE BALANCE AND CONTENTS OF INORGANIC PHOSPHORUS.

The acid-base balance of the blood was not significantly affected by the different treatments of the diet and contents of inorganic phosphorus were within the standard for all treatments. It may thus be concluded that the types and amounts of acid used have not affected contents of inorganic phosphorus in the blood.

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TRAWL FISH (SPRATS SAND SAND EEL) AS SILAGE OR FROZEN IN MINK FEED (SUMMER 1981).

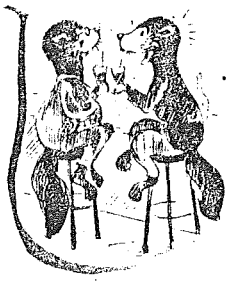
(Forsøg med industrifisk og fiskeensilage).

G. Hillemann, North Jutland Experimental Fur Farm, Nr. Rubjerg, DK 9480 Løkken.

16 groups of 100 mink kits each were given feed containing from 20% to 64% of frozen or silaged trawl fish starting either on 15th July, 1st of August or 1st of September. Feed consumption and weight increase normal. Size and colour of pelts were not affected with certainty by the trial feed, but the quality was affected negatively, especially in the pastels, if too early they received too high levels. Extra addition of vitamins or selene was not given. Macroscopic examination of bodies and organs after pelting did not reveal anything abnormal.

It was concluded that considerable quantities of frozen trawl fish and trawl fish silage may be used when giving due consideration to time and level for the introduction of this feed component.

Dansk Pelsdyravl, Vol. 44 (6), 253-255, 1981.
12 tables. Author's summary.
In Danish.



WATER INTAKE AND SOME DIETARY FACTORS AFFECTING IT.

J. Mäkelä, M. Valtonen, Helve's Foundation, Vantaa, Finland.

Normal tissue functions depend on the precise maintenance of the composition of the extracellular fluid. The fluid balance is primarily controlles by the ingestion of water and the excretion in the urine. Ambient temperature and dry matter content of the ration are considered the factors most closely related to water intake. It has been confirmed that water intake in summer at the temperature of 20-30° C is tenfold of that of the winter time. But when the dry matter intake is constant, the total water intake counted as the water content of the food added to the water consumption is not affected by the dry matter content of the ration. The excretion rate of urine mostly depend on the amount of electrolytes and endproducts of protein metabolism to be excreted and the renal concentrating capacity.

The effect of dietary nitrogen in water intake and urinary excretion in mink was studied on two diets differing in protein contents. Increasing the protein content of metabolizable energy in the diet from 21% to 44% resulted in an increase in water intake from 133 ml/day to 157 ml/day and urine flow rate rose from 50 ml/day to 70 ml/day. Urine osmolality increased from 1471 mOsm/kg to 2151 mOsm/kg.

The effects of sodium chloride load were studied by keeping the protein content constant and altering the salt content from 0.6% to 2.6% of the of the wet weight of the diet. When the salt content was under 1% it neither affected water intake nor urinary excretion. But when the percentage of NaCl in the ration increased over 1%, the water intake increased to over 400 ml/day when the salt content rose to 2.6%. Elevated sodium excretion resulted in increased urine flow rates and decreased urine osmolality. The effect of supplementary salt on water intake was very pronounced. Due to the ability of mink to excrete the nitrogen load by increasing urine osmolality increased protein intake had only a slight effect on the demand for water.

Nordiske Jordbruksforskeres Forening, Möte om pelsdyrproduksjon, 1982, Ålesund, Norway.
2 tables, 7 references, 5 pp. Author's summary.
In Swedish.

SLAUGHTER TRIALS AS THE BASIS FOR ESTIMATING THE DEPOSITION OF ENERGY AND NUTRIENTS IN FUR ANIMALS.

(Slagteforsøg som grundlag for bestemmelse af energi- og næringsstofaflejring hos pelsdyr).

N. Enggaard Hansen, N. Glem-Hansen, G. Jørgensen, Royal Veterinary and Agricultural University, Dept. of Animal Nutrition, Bülowsvej 13, DK 1870 Copenhagen, Denmark.

A slaughter trial to estimate the deposition of energy and nutrients by fur animals is described, based on analyses for DM content, nitrogen, ash content, calcium, P, Mg, Na, K, Fe, Zn, Cu and Mn. Particular emphasis is placed on the contents of Ca and P in mink during the growing period, after feeding on 3 different feed mixtures containing energy 103.2, 121,8 and 1400 kcal/100 g; crude protein 10.1, 11.7 and 12.8 g/100 g.

Dansk Pelsdyravl, 44 (12), 593-595, 1981.
2 tables, 2 figs., 8 references. CAB-abstract.
In Danish.

EFFECT OF ORGANIC AND INORGANIC SULFATE SUPPLEMENT IN MINK DIETS.

E.R. Chavez, Macdonald College of McGill University, Ste. Anne de Bellevue, Quebec H9X 1C0.

An experiment was conducted to assess the effects of supplementation of sulfur-amino acids, inorganic sulfate and organic sulfate in mink diets on pelt quality. Ninety pastel male mink were used for 179 days, from about 7 wk of age to pelting time. Animals were randomized into individual cages in one of the following dietary treatments: (1) control diet; (2) as 1, supplemented with 0,5% DL-methionine; (3) as 1, supplemented with 0,8% L-cystine (equivalent basis with methionine); (4) as 1, supplemented with 0,5% potassium sulfate; (5) feather-meal at 10% level in the control diet replacing fresh animal by-products, and (6) as 5 at 20% level. Feed was provided daily on an ad libitum basis

and water was available at all times from automatic nipples. At the end of the experimental period the control group averaged 1770 g. DL-methionine supplementation improved pelt quality, and average return per pelt (40.18) was increased by more than $1 compared to control minks (38.92). Supplemental L-cystine did not show any significant effect either in pelt quality of size compared to control, given similar average return per pelt (38.82). Supplementation of potassium sulfate significantly reduced pelt quality, giving a lower return per pelt (37.59) than control. fish meal at 10% level appears to slightly improve both pelt quality and size, giving a greater average return per pelt (40.58) than controls. At higher level (20%) feathermeal although pelt quality was improved, the size of the pelt was greatly reduced giving an average return per pelt (32.32), much lower than control mink.

Annual Meeting of the Canadian Society of Animal Science, St. Catharines, Ont., Canada, Aug. 10-13 1981. Can J. Anim. Sci., 61 (4), 1981.
Only abstract received. Author's abstract.

FEEDING SUPPLEMENTAL IODINE TO MINK: REPRODUCTIVE AND HISTOPATHOLOGIC EFFECTS.

R.E. Jones, R.J. Aulerich *, R.K. Ringer, * Dept. of Animal Science, Michigan State University, East Lansing, Michigan 48824, USA.

Adult mink were fed various concentrations of supplemental iodine, ranging from 10 to 320 ppm, for 1 or 7 mo before breeding. Long-term, low-level (10-20 ppm) iodine supplementation was beneficial for both reproduction and lactation. Supplemental iodine in excess of 80 ppm, however, resulted in a reduction in the number of females that whelped, a decrease in litter size, and an incraase in kit mortality. Thyroid glands of kits whelped and nursed by dams fed more than 20 ppm supplemental iodine, both short-term and long-term, showed hypertrophy marked by follicular cell hyperplasia and a decreased amount of colloid. Similar histopathologic lesions were observed in the thyroids of adults that received 80 ppm or mor supplemental iodine; also observed were numerous lesions in the gallbladder.

Journ.of Toxicology and Environmental Health, 10, 459-471, 1982.
3 tables, 6 figs., 21 references. Authors' abstract.

FISH SCRAP AS FEED FOR FUR ANIMALS. FACTORS INFLUENCING THE NUTRITIVE VALUE.

A. Skrede, Dept. of Poultry and Fur Animal Science, N-1432 Ås-NLH, Norway.

The fish scrap commonly marketed as feed for fur animals has been shown to contain protein of relatively good quality. However, variable composition may be unfavorable for utilization in balanced diets. The tendency towards incrasing proportions of bone, skin and viscera, and less flesh, may reduce quality. This would limit the possibility of using fish scrap as the main source of protein. The digestibility of the proteins in fish bone may be enhanced by fine homogenization of heat treatment. However, considering the poor amino acid composition, this may not be advantageous from a nutritional point of view. Thus, high levels of fish skin, which is very similar to fish bone with regard to amino acid composition, have been shown to cause reduced N balance, and poor growth and reproduction in mink. Conversely, fish viscera with good hygienical quality and moderate fat levels seems to be an acceptable protein source for mink.

Scandinavian Association of Agricultural Scientists, Ålesund 1982.
3 tables, 1 fig. Author's abstract.
In Norwegian.

EVALUATION OF SHRIMP AND KING CRAB PROCESSING BYPRODUCTS AS FEED SUPPLEMENTS FOR MINK.

B.E. Watkins, J. Adair, J.E. Oldfield, Oregon State University, Corvallis 97331, USA.

Three products derived from shrimp (Pandalus jordani) processing waste and a protein concentrate extracted from king crab (paralithodes camschatica) waste were evaluated as feed supplements for mink, replacing approximately 10 and (or) 20% of the protein in a standard wet diet (33% protein, dry basis). Mean analyses (protein, Ca, chitin, ether extract) of waste products on a dry basis were as follows: untreated shrimp waste (25.5, 14.4, 19.3, 3.6%); shrimp meal (26.6, 13.8,

17.6, 4.3%); sieved shrimp meal (34, 10.3 10.6, 5%) and crab protein concentrate (67.1, 1%, trace .5%). Mink of both sexes and strains fed crustacean waste diets generally had lower final weights and weight gains and greater feed consumption than control groups fed a standard diet. These effects were most pronounced in males and, with the exception of the 20% shrimp meal group, appeared to be related to dieatry fat level. Lower weight gains by males on the high shrimp meal diet vs the high sieved shrimp meal diet appeared to result from excess Ca intake. General condition and pelt characteristics were not appreciably affected in any of the groups. We conclude that crustacean waste products could be satisfactory protein supplements for mink, provided that the protein and energy concentrations of the diet are maintained at sufficient levels and dietary Ca does not become excessive.

Journal of Animal Science, Vol. 55, no.3, 1982, 578-589.
11 tables, 42 references. Authors' summary.

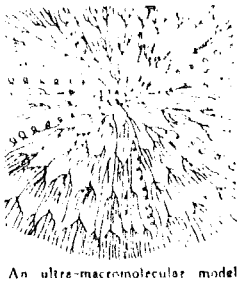
TRIALS WITH POTATO STARCH PRODUCTS.

(Forsøg med kartoffelstivelsesprodukter).

G. Hillemann, Sitkagranvej 8, DK 9800 Hjørring, Denmark.

Potato starch products from the Dutch firm of AVEBE were included in diets for mink. Two products with digestibility 57.4 and 65.4 percent were used. Digestibility of crude protein and fat was 50 to 75 percent. The quality of pelts from 300 young mink was estimated, and silkiness of standard and pastel pelts was assessed. There was no significant difference in the quality of pelts from mink given the control diet or diets with potato starch, although there tended to be fewer pelts of very poor quality when potato starch was used. It is concluded that potato starch may replace conventional carbohydrates in diets for mink.

Dansk Pelsdyravl, 44 (11) 550-551, 1981.
4 tables. CAB-abstract.
In Danish.



An ultra-macromolecular model starch granule.
Letter A represents a reducing the primer. (NIKUNI 1969)

TRIALS WITH POULTRY FAT.

(Forsøg med fjerkræfedt).

G. Hillemann, Sitkagranvej 8, DK 9800 Hjørring, Denmark.

Poultry fat replaced pig fat in diets for 200 young mink. Pig fat had about twice as much stearic acid and a third of the linoleic acid content of poultry fat. Both were commercial products. Pastel mink and standard mink given poultry fat produced better quality pelts than those given pig fat; the improvement in the quality of pastel pelts was better than that of the standard variety. Pastel pelts were "silkier" when poultry fat was included in the diet.

Dansk Pelsdyravl, 44 (12), 589-590, 1981.
6 tables. CAB-abstract.
In Danish.

CARCASS WASTE AND FROZEN INDUSTRIAL FISH IN THE BREEDING PERIOD FOR MINK.

(Slagteaffald of frosset industrifisk i avlsperioden til mink).

G. Hillemann, Nordjysk Pelsdyrforsøgsfarm, Sitkagranvej 8, DK 9800 Hjørring.

Mink were given either a control diet (1) or a similar diet containing 15 percent pig offal (2) or 30 percent sprats (3). The control feed contained 10 percent sprats but no pig offal, and diet (2) contained 5 percent sprats. Diet (3) contained no pig offal. The high ash content of the pig offal did not seem to be detrimental to the growth of young mink and performance was slightly better with the control diet (1). Diet (3) also had a favourable effect on the growth of the mink. It was concluded that both pig offal and sprats can be used with advantage in diets for mink during the winter and in the breeding period.

Dansk Pelsdyravl, 44 (12), 589-590, 1981.
4 tables. CAB-abstract.
In Danish.

THE EFFECT OF SOYA PROTEIN CONCENTRATE - SOYCOMIL K - ON MINK IN THE GROWTH PERIOD.

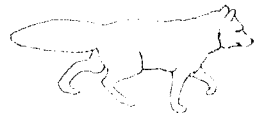
(Soycomil K.)

G. Hillemann, North Jutland Experimental Fur Farm, Nr. Rubjerg, DK 9480 Løkken.

Previous experiments on soya products have shown the technical processing of the beans to be of great importance. The product tested, Soycomil K, is made by Unimills in Holland and contains 65% crude protein. The Antitrypsinactivity, as well as the easily hydrolysable carbohydrates and the antigens have been removed.

The experiment was carried out in the summer 0f 1980. 200 mink kits were fed a diet containing 10% Soycomil K, that is the equivalent of 40% of the protein in the diet. When compared to the control group no differences were found in respect of weight increase or feed consumption, but both quality and colour were better in the test group.

Dansk Pelsdyravl, Vol. 44, 7, 304-305, 1981.
5 tables. Author's summary.
In Danish.



LOW PROTEIN FEED FOR FOX.

H. Berg, T. Juokslahti, J. Mäkelä
Finnish Fur Breeders Association, Helve's Foundation

The rapid growth of fox production in Finland has caused an increased demand for feedstuffs. Half of the 500 000 tons of feed production goes to the fox. That is why much attention has been paid to the protein requirement of the fox and to the possibilities of saving valuable protein feedstuffs.

During 1980 - 81 feeding experiments were carried out at Helve's Foundation with bluefoxkits until pelting. In the first experiment production effect of two feeds with 34 % and 36 % of meta-

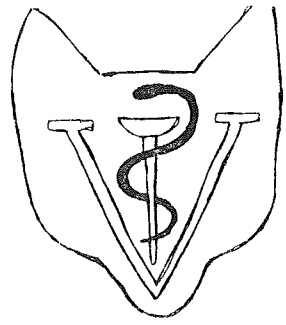
bolizable energy from protein was compared with a control feed with 46 % of ME from protein. In the experiment next year an ordinary feed for fur-bearing animals was compared with three low protein feeds. During the period July - August the protein percentage of ME was 47 in the control feed and 29, 34 and 28 in the three low protein feeds. During the period September - pelting the protein percentage for the corresponding feeds was 37, 26, 26 and 25 % of ME. The proportion of fat and carbohydrates varied between the groups in the two experiments. The animals were fed once a day and were weighed regularly. The feed consumption was controlled in the latter experiment.

These experiments confirm the results of previous researches that there is no difference in size and quality when comparing bluefoxpelts produced with a lower protein level to those of higher protein levels.

In 1981 all bigger producers of fur-animal feed in Finland have begun to make separate feed for mink and fox. The same feed, rich in protein, is used during the breeding period. In July the feed for foxes is changed to the low protein feed. For the year 1982 the Finnish Fur Breeders Association has recommended that foxfeed has 10 percentunits less of ME from protein than minkfeed. This measure has meant great saving in expenses for the Finnish furindustry.

NJF-meeting, Ålesund, Norway
11 tables, 3 references
In Swedish

Author's abstract



VETERINARY

PLASMACYTOSIS IN MINK.
THE CHARACTER OF THE DISEASE, QUALITATIVE AND QUANTITATIVE DIAGNOSTICS, AND THE PROGRESSION OF THE DISEASE WITH SPECIAL DIETS AND HOUSING.

(Plasmacytose hos mink. Sykdommens karakter, kvalitativ og kvantitativ CIEP- diagnostikk samt udvikling av sykdommen under bestemte forings- og miljømessige forhold).

Knut Frøysedal, Norges Veterinærhøgskole, Dal Forsøksgård, Heggedal, Norway.

Six papers are included in the work.

The first paper gives a description of plasmacytosis (Aleutian Disease) in mink. The disease is caused by a parvovirus and is one of the group of "slow virus diseases". It is a Type III immunocomplex disease. Vertical transmission is considered to be more important than by the horizontal route. Counter current immunoelectrophoresis (CIEP) is at present the most practical diagnostic method. The disease is characterised by a general infiltration of plasma cells. Cause of death is uremia due to infiltration of immunocomplexes and plasma cells into kidneys. The pathogenesis of the disease is similar to some human diseases.

1 table, 38 references, 19 pp.

The second paper describes a method for quantitative detection of antibodies to plasmacytosis, using counter current electrophoresis. Antibodies were produced in an inoculation experiment with sapphire and standard mink. Antibody production was significantly higher in the group of standard mink than in the sapphire group during the period 15-111 days after inoculation. This finding is in contrast to an experiment where the infection was caused by netral means. The explanation may be that the dose of antigen inoculated was so high that it produced immunological tolerance. The Iodine Agglutination Test (IAT) gave 100% detection whenever the antibody titre exceeded 1:1024. Mortality was

higher among the sapphire mink than the standard.

1 fig., 4 tables, 10 references, 6 pp.

The third paper describes an experiment whose aim was to find out whether shortage of vitamin B or vitamin E has any effect on the development of plasmacytosis in mink. A total of 120 growing standard mink were divided into four groups and fed experimental food for 220 days. There was no evidence that shortage of these vitamins accelerated the development of plasmacytosis in mink.

4 tables, 7 references, 11 pp.

The fourth paper describes a study into the effect of feeding single cell produced by Pseudomonas methylotropha on the development of plasmacytosis in mink. Two groups of animals were fed a diet containing 4% og 10% Pruteen SCP. Each of the experimental groups and the control group consisted of 12 sapphire and 18 standard mink. At the start of the experimental period, the animals were placed in cages in mink sheds from which mink heavily infected with plasmacytosis had just been removed, and which had not been cleaned or disinfected. The experimental animals showed a significantly lower weight gain, lower haematocrit values, higher mortality rate than the controls. The mortality rate was higher among the sapphire strain than among standard mink. It is suggested that the accelerating effect of Pruteen SCP on the development of plasmacytosis may be due to endotoxins in Pruteen SCP leading to an overstimulation of the immune response system and thus enhancing immune complex deposition in target organs.

5 tables, 2 fits., 32 references, 14 pp.

The fifth paper describes a field experiment where the frequency of plasmacytosis in nine different types was studied. A total of 3159 animals were used. The frequency of infection varied greatly. The breeding results were to some extent better in the mutants with heavy infection than i those with lower infection rates. The correlation between frequency of infection of parents and offspring was statistically significant.

1 fig., 2 tables, 16 references, 10 pp.

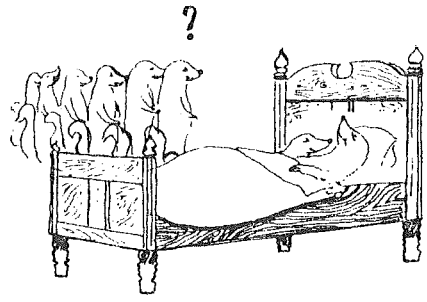
The sixth paper concerns an experiment where 248 growing standard mink were removed from a farm with low frequency of plasmacytosis (30%) to a farm with high frequency (80%). As a control group, 456 standard mink were retained on the first farm. After a period of four months, the plasmacytosis CIEP test was carried out.

The controul group had an infection frequency of 11.8% while in the transferred group the frequency was 52.0%. The experiment was repeated the following year with 107 mink in the experimental group and 480 in the control group. Infection frequencies of the experimental and control groups were then 4.61% and 2.68%, respectively. The differences were discussed, and were postulated to be caused by a reduction effect of the virulence of the plasmacytosis agent after passages.

1 table, 6 references, 6 pp.

Thesis, Dr. Scient. 1981.

Author's summary.



AD-free males do have much
better capacity - both
quantitatively and qualitatively !

ALEUTIAN DISEASE OF MINK: SERODIAGNOSIS AND SEROEPIDEMIOLOGY.

Peter F. Wright, University of Guelph, Ontario N1G 2W1, Canada.

The experiments described in this thesis were undertaken to investigate the potential of the enzyme linked immunosorbent assay (ELISA) as an experimental and serodiagnostic technique for the detection of antibody to Aleutian disease virus (ADV) in the serum of infected mink.

The optimal pH for the reaction of anti-ADV antibody and viral antigen in the ELISA was pH 8.0. Antibody binding activity in ELISA was greatly reduced at pH 7.4. The optimal antigen concentration for use in the ELISA was eight times less than the concentration required for counterimmunoelectrophoresis (CIEP).

The immunological sensitivity of the ELISA was at least 80 times greater tan CIEP when compared under experimental conditions. The ability of the ELISA to detect anti-viral antibody in the serum of mink in the first week of infection with ADV was comparable to the detection of antibody by CIEP. Antibodies of the IgG and IgM classes were detectable simultaneously by the ELISA in the first week of infection.

After experimental infection with a high dose of virus to produce progressive Aleutian disease (P-AD), IgG and IgM ELISA titers increased exponentially. Maximal titers were detected two to three weeks after infection and then sharply declined to low levels by seven weeks. ELISA titers remained stable but low for the duration of the 29 week experiment. Anti-viral antibody titers, measured by CIEP, increased exponentially and peak titers were attained five to seven weeks after infection. CIEP titers remained stable and high for the duration of the experiment.

When mink with natural, non-progressive Aleutian disease (NP-AD) were tested by ELISA, no anti-viral antibody activity could be demonstrated in either the IgG or IgM class. Precipitating antibody was detectable by CIEP in these mink.

The macromolecular fraction (Sephacryl S300) of serum from normal mink, from mink with NP-AD and from mink in late stages of experimental P-

AD caused inhibition in the ELISA of anti-ADV antibody activity in high ELISA titered serum from mink in early stages of P-AD. This inhibitory effect may account for the sudden decrease in serum ELISA titers observed seven weeks after experimental infection and may also be responsible for the inability to detect antibody activity in the ELISA of serum from mink with NP-AD.

The ELISA, by itself, was not suitable as a diagnostic screening test due to its inability to detect mink with NP-AD. Using CIEP as an indicator of infection, the ELISA was effective in differentiating mink with NP-AD from mink with P-AD. The combined use of the ELISA and CIEP could be beneficial in determining the prevalance and distribution of NP-AD and P-AD in ranch mink.

Dissertation Abstracts International, Vol. 42, No. 03, Sept. 1981.
Only abstract received.

INHIBITION OF PRECIPITATION IN COUNTER CURRENT ELECTROPHORESIS. A SENSITIVE METHOD FOR DETECTION OF MINK ANTIBODIES TO ALEUTIAN DISEASE VIRUS.

Bent Aasted, Anders Cohn, Dept. of veterinary Virology and Immunology, The Royal Veterinary University, Bülowsvej 13, DK 1870 Copenhagen.

Inhibition of precipitation in counter current electrophoresis was at least 32 times more sensitive when compared to the normal counter current electrophoresis for the demonstration of mink antibodies against Aleutian disease virus (ADV). ADV antigen can be produced from mink organs or in cel culture. The reactivity of the two types of antigen in the two kinds of counter current electrophoresis methods is described in this report. When 22 mink sera were titrated in normal counter current electrophoresis against cell culture produced antigen and organ produced antigen, significantly lower antibody titres were found with cell culture produced antigen. This difference was not found when inhibition of precipitation of counter current electrophoresis was used.

Acta. path. microbiol. immunol. scand. Sect. C. 90, 15-19, 1982.
2 figs., 1 table, 7 references. Authors' abstract.

IDENTIFICATION OF A NONVIRION PROTEIN OF ALEUTIAN DISEASE VIRUS: MINK WITH ALEUTIAN DISEASE HAVE ANTIBODY TO BOTH VIRION AND NONVIRION PROTEINS.

Marshall E. Bloom, Richard E. Race, James B. Wolfinbarger, Lab. of Persistent Viral Disease, Rocky Mountain Laboratories, Natl. Inst. of Allergy and Infectious Diseases, Hamilton, Montana 59840.

We studied Aleutian disease virus polypeptides in Crandall feline kidney (CRFK) cells. When CRFK cells labeled with [^{35}S]methionine at 60 h postinfection were studied by immunoprecipitation with sera from infected mink, the major Aleutian disease virus virion polypeptides (p85 and p75) were consistently identified, as was a 71,000-dalton nonvirion protein (p71). The peptide maps of p85 and p75 were similar, but the map of p71 was different. p85, p75, and p71 were all precipitated by sera from Aleutian disease virus-infected mink, including those with signs of progressive disease, but heterologous sera raised against purified Aleutian disease virus did not precipitate the nonvirion p71. These results indicated that the nonvirion p71 was unrelated to p85 and p75 and further suggested that mink infected with Aleutian disease virus develop antibody to nonvirion, as well as structural, viral proteins.

Journal of Virology, Aug. 1982, 608-616.
8 figs., 1 table, 42 references. Authors' anstract.

THE FAILURE OF AN INACTIVATED MINK ENTERITIS VIRUS VACCINE IN FOUR PREPARATIONS TO PROVIDE PROTECTION TO DOGS AGAINST CHALLENGE WITH CANINE PARVOVIRUS-2.

S. Carman, C. Povey, Clinical Research, Dept. of Clinical Studies, Ontario Veterinary College, Guelph, Ontario N1G 2W1.

Four experimental vaccine preparations comprising a strain of mink enteritis virus inactivated by either formalin or betapropiolactone, and either adjuvanted or nonadjuvanted, failed to stimulate a consistent serum antibody response in 20 vaccinated dogs and failed to protect

all but one of these dogs against oral challenge with canine parvovirus-2.

Can. J. comp. Med. 46, 47-50, 1982.
3 tables, 18 references. Authors' abstract.

THE PLAQUE-FORMING FACTOR FOR MINK LUNG CELLS PRESENT IN CYTOMEGALOVIRUS AND HERPES-ZOSTER VIRUS STOCKS IDENTIFIED AS MYCOPLASMA HYORHINIS.

G. Darai, R.M. Flügel, L. Zöller, B. Matz, A. Krieg, H. Gelderblom, H. Delius, R.H. Leach, Inst. für Medizinische Virologie der Universität Heidelberg, Im Neuenheimer Feld 324, 69 Heidelberg, F.R.G.

Previous investigation of the ability of cytomegalovirus and varicella-zoster virus to replicate in a variety of cell lines suggested that both virus types plaqued with high efficiency in mink lung cells. However, many of the virus isolated used appeared to be contaminated with mycoplasma. We now report that the observed cytopathic effect is due to a mycoplasma which grows lytically to high titre in mink lung cells, but is difficult to cultivate in cell-free media. The mycoplasma was plaque-purified and shown to contain DNA with a buoyant density of 1-684 g/ml, with restriction endonuclease patterns identical to the porcine mycoplasma M. hyorhinis. This was conformed by serological identification.

J. gen. Virol. 1981, 55, 201-205.
1 table, 1 fig., 12 references. Authors' summary.

PULMONARY EMBOLI OF NUCLEUS PULPOSUS ACCOMPANYING DEGENERATION OF INTERVERTEBRAL DISKS IN RANCH MINK.

W.J. Hadlow, National Institutes of Health, Rocky Mountain Laboratories, Hamilton, MT 59840, USA.

Emboli of nucleus pulposus were found often in the lungs of older pastel, sapphire, and triple pearl mink (Mustela vison) that commonly suffer from severe degeneration of intervertebral disks. Most emboli were small (50 to 150 µm in diameter) acellular masses that resembled severy degenerated disk tissue. Larger ones, which often had faintly visible remnants of chondrocytes, were partly attached to the arterial wall and had a thin layer of endothelium covering their free surfaces. The largest emboli (400 to 850 µm across) appeared as metachromatic fragments of chondroid tissue like that of the degenerated intervertebral disks. Regardless of their size and however long they may have been present, none of the emboli was accompanied by any cellular response in the surrounding pulmonary tissue. The pieces of degenerated nucleus pulposus probably entered the systemic venous circulation from dorsal extrusions of the tissue through the degenerated annulus fibrosus and from intrusions of it in the vertebral bodies (Schmorl's nodes).

Although an incidental microscopic finding of no direct clinical significance, these pulmonary emboli of nucleus pulposus nevertheless are a rough indicator of the high prevalence of intervertebral disk degeneration in ranch mink.

Vet. Pathol. 19, 444-447, 1982.
7 figs., 10 references. Author's abstract.

TYMPANIC MEMBRANE TEMPERATURE DURING EXPERIMENTAL OTITIS MEDIA DUE TO STREPTOCOCCUS PNEUMONIAE IN CHINCHILLAS.

Robert O. Fisch, Bruce E. Eaton, G. Scott Giebink, Dept. of Pediatrics, Box 384 Mayo Memorial Building, University of Minnesota, 420 Delaware St., SE, Minneapolis, MN 55455.

The relationship between tympanic membrane temperature and acute purulent otitis media was investigated using thermistor probes to measure surface temperatures of the tympanic membrane in chinchillas with experimental unilateral otitis media due to Streptococcus pneumoniae. Sedated animals were kept on a thermally insulated surface during the procedure to avoid hypothermia. Although the animals' core temperature rose during middle ear infection, direct measurement of tympanic membrane temperature did not show a significant difference between the infected and uninfected contralateral ears.

Laboratory Animal Science, 32, 3, 278-279.
1 fig., 11 references. Authors' summary.

PHAGE TYPING OF STAPHYLOCOCCUS INTERMEDIUS ISOLATED FROM PIGEONS, FOXES, AND MINK WITH USE OF CANINE PHAGES.

Junichi Kawano, Akira Shimizu, Shige Kimura, Laboratory of Animal Hygiene, Fac. Agr. Kobe University, Japan.

Phage typing was performed on Staphylococcus intermedius isolated from pigeons, foxes and mink, with use of the 4 canine phages, 06, 40, 58, and 93. Forty-eight (87.3%) of the 55 pigeon strains, 19 (95.0%) of the 20 fox strains, and 19 (100%) of the 19 mink strains were typable at either routine test dilution (RTD) or 100xRTD. S. intermedius isolated from pigeons, foxes, and mink were highly susceptible to the 4 canine phages.

Sci. Rep. Fac. Agr. Kobe Univ., 15, 177-180, 1982.
2 tables, 14 references. Authors' abstract.
In English with abstract in Japanese.

COMMUNICATION

3e CONGRES INTERNATIONAL SCIENTIFIQUE
SUR LA PRODUCTION DES ANIMAUX A FOURRURE

3rd INTERNATIONAL SCIENTIFIC CONGRESS
IN FUR ANIMAL PRODUCTION

25, 26, 27 avril 1984, Versailles, France

I N V I T A T I O N

ORGANISATEURS : Institut National de la Recherche Agronomique
Institut Technique de l'Aviculture et de l'Elevage des Petits Animaux
Fédération Nationale de la Fourrure
Fédération des Eleveurs Français d'Animaux à Fourrure et Association des Eleveurs Français de Visons

DATES : Avril 1984 : du mercredi 25 au vendredi 27 (excursion post congrès exclue)
April 1984 : from Wednesday 25 to Friday 27 (post-congress tour excluded)

LIEU *(Place)* : VERSAILLES, France - Hôtel "Trianon Palace"

ADRESSE DU SECRETARIAT avant le congrès :
Office address before the Congress :

3e C.I.S.P.A.F.
Laboratoire des Pelages, Toisons et Fourrures
I.N.R.A.
78350 Jouy-en-Josas, France
Tél. (3) 956 80 80 Télex : INRACRZ 695431F

LANGUES OFFICIELLES : français, anglais
Official languages : French, English

PROGRAMME, COMMUNICATIONS :
Programme, reports :

Comme les Congrès précédents, ce 3e Congrès est destiné à faire le point sur les connaissances scientifiques ayant trait à l'amélioration de la production des animaux à fourrure (mouton et lapin exclus, ces espèces faisant l'objet de congrès spéciaux). Les différentes sessions concerneront la Génétique et Sélection, la Nutrition, la Reproduction, la Pathologie et le Pelage. Prévoir un manuscrit n'excédant pas 6 pages (tableaux et graphiques compris) correspondant à un exposé oral de 10 minutes au maximum. Le manuscrit devra parvenir au secrétariat le **15 décembre 1983** au plus tard, afin que les textes soient remis aux participants à l'ouverture du Congrès.

As for the previous Congresses, the aim of this 3rd Congress is to review scientific knowledge on progress achieved in production of fur bearer animals (sheep and rabbit excluded, as these species are discussed in their own congresses). The different sections will deal with Genetics and Selection, Nutrition, Reproduction, Pathology and Pelage. Papers should not be longer than 6 pages including tables and graphs and should correspond to a maximum 10-minutes speech. Manuscripts should be received not later than **December 15, 1983** *so that participants will have them at the opening of the Congress.*

DROITS D'INSCRIPTION (documents, réception en cours de congrès) :
Registration fees (information, papers congress receptions) :

200 FF membres participants
participating members

100 FF membres accompagnants
accompanying persons

FRAIS DE SEJOUR :
Accomodation expenses :

Environ 1 600 FF pour les membres participants occupant 1 chambre et environ 1 300 FF pour les personnes accompagnatrices hébergées dans la même chambre. Ces prix comprennent les 2 nuits des 25 et 26 avril, les repas jusqu'au 27 avril midi, les activités sociales et les programmes des personnes accompagnantes pendant le congrès.

About FF 1 600 for participating members occupying 1 bedroom and about FF 1 300 for accompanying persons in the same bedroom. These prices included the 2 nights of April 25 and 26, meals until noon on April 27, social activities and the programme for accompanying persons during the Congress.

INSCRIPTION PROVISOIRE :
Pre-registration :

Veuillez nous retourner la fiche ci-jointe pour votre réponse de principe avant le 1er mars 1983. C'est indispensable pour vous envoyer les précisions complémentaires et les documents définitifs.
Nous faisons de notre mieux pour que votre séjour soit non seulement fructueux, mais encore agréable et amical, comme dans les précédents congrès : le cadre plein de charme du "Trianon Palace", en bordure du Château de Versailles, y participera. Le centre de Paris n'est qu'à 20 km et les liaisons ferroviaires sont fréquentes et rapides avec la capitale et les aéroports d'Orly et de Roissy.

Please send your answer on the enclosed pre-registration form before 1st March 1983. It is needed so that we can send you complementary information and definitive documents.
We are doing our utmost to make your participation fruitful, enjoyable and friendly, as in the previous Congresses : the lovely surroundings of the "Trianon Palace" which looks out on the park of the Palace of Versailles will contribute. Versailles is only 20 km from the center of Paris and rail connections are rapid and frequent with the capital and the two airports of Orly and Roissy.

Le Président du Comité d'Organisation
The Chairman of the Organizing Committee

J. ROUGEOT

T. Rougeot

With kind regards

T. Rougeot

3e CONGRES INTERNATIONAL SCIENTIFIQUE
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25, 26, 27 avril 1984, Versailles, France

FORMULAIRE A RENVOYER APRES L'AVOIR REMPLI
avant le 1er MARS 1983

PLEASE, FILL IN AND RETURN THIS FORM
before MARCH 1st 1983

1. PARTICIPANT

Prof. ☐ Dr. ☐ Mr ☐ Mme / Mrs ☐ Mlle / Miss ☐

NOM : Name

Prénom : First name

Institut, Laboratoire, Firme : Institute, Laboratory, Firm :

Profession :

Adresse (à laquelle les documents seront envoyés) : Address (which documents should be sent) :

Pays (country) :

2. COMMUNICATIONS

	oui yes	non no
Présentera une communication I wish to give a paper	☐	☐

Titre probable : Tentative title :

	oui yes	non no
Présentera un poster I wish to present a poster	☐	☐

Titre probable : Tentative title :

3. PERSONNES ACCOMPAGNANT LES PARTICIPANTS
Persons accompanying participants

Mme / Mrs / Mlle / Miss / Mr

Mme / Mrs / Mlle / Miss / Mr

Mme / Mrs / Mlle / Miss / Mr

Date

Signature

Secrétariat : Jean Rougeot, Institut National de la Recherche Agronomique,
Laboratoire des Pelages, Toisons et Fourrures, 78350 Jouy en Josas, France.
Tél. (3) 956-80-80 Télex. INRACRZ 695431

THE FBA YORK CONFERENCE 1983

SECRETARY:
MRS. D. E. HAMMETT

FUR BREEDERS' ASSOCIATION
OF THE UNITED KINGDOM

Hudson's Bay House (1st Floor)
67 Upper Thames Street, London EC4V 3AB

TELEPHONE: 01-248 9095

8/83

14th January 1983

Dear Sirs,

FBA YORK CONFERENCE - 8th/9th/10th April 1983 - Royal Station Hotel.

Bookings can now be taken. Programme and List of Speakers available shortly.

COST:

Visitors, also NFE and Irish FBA Members	£90.00 per person
Visitors' children	£65.00 per child.

INCLUDING: Service charge and VAT at the hotel, hotel accommodation for two nights of 8th and 9th April 1983, all rooms with bath; all meals; full lecture programme Saturday all day and Sunday morning. Drinks reception Friday evening followed by evening dinner with table d'hote (not a la carte) and Dinner-Social Saturday 9th April (dress informal).
Free Conference Report when printed mid-summer.

FROM:	Friday 8th April 1983	6.00 pm
TO:	Sunday 10th April 1983	2.30 pm

EXCLUDING: Extras, such as morning teas, telephone calls, wines at meals (some wine included Saturday evening dinner).

We warmly welcome visitors, home and overseas. Write, or telephone, your booking enquiry to this office.

Yours sincerely,

D.E.Hammett(Mrs.)
Secretary.

FUR BREEDERS' ASSOCIATION OF THE U.K.
ANNUAL DINNER ORDER FORM

SATURDAY, 19TH FEBRUARY 1983
THE WALDORF HOTEL, ALDWYCH, LONDON, WC2B 4DD.

Price per person - £16.50 inclusive of wine

We require ..... Tickets

FULL NAMES of those attending (block capitals please)

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HOTEL RESERVATION FORM for night of FBA Dinner, 19th February 1983

Price:- Twin bedded room with bath £45.00 EXCLUSIVE of breakfast
Single " " " £36.00 " "

English breakfast £5.95 Continental breakfast £4.75

PLEASE RESERVE at The Waldorf Hotel, Aldwych, London, WC2B 4DD
Tel. No. 01-836 2400, for Saturday night, 19th Feb. 1983.

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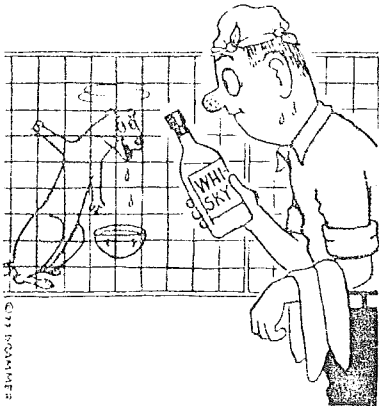

Is that one of the new ideas from the York Conference ?

FUR BREEDERS' ASSOCIATION
OF THE UNITED KINGDOM
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67 Upper Thames Street, London EC4V 3AB
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3/83

16th January 1983

Dear Sirs,

We can now take orders for the Report of the FBA's 1983 Eighteenth "Training Course & Conference" to be held 9th/10th April 1983.

PRICE : £10.00 per copy, plus postage.

Yours sincerely,
D.E.HAMMETT(MRS.)
Secretary.

TEAR OFF

3/83

TO: The Secretary, Fur Breeders' Association of the U.K.,
Hudson's Bay House, 67 Upper Thames St., LONDON EC4V 3AB

We wish to be invoiced for .... copy/copies of the 1983 FBA"YORK" REPORT.

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LETTERS TO THE EDITOR

ARPAD DUDAŠ
"VOJVODINAINVEST" NOVI SAD 21000
Bul. M. Tita 3/II, Yugoslavia.

INFORMATION

ON POSSABILITIES OF ECONOMICALY JUSTIFIED BREEDING OF STONEMARTEN (MUSTELA FOINA)

SRBOCROAT: Kuna belka
GERMAN: Der Steinmarder

Most of the animals with precious furs come from teritories outside of Yugoslavia, and breeding of these animals gradually spreads throughout Yugoslavia. Receantly the demand for stonemarten furs has notably increased, which was, due to the lack of it after the war, abandoned by fachion designers. It seems that this tendency is of a more permanent caracter.

Knowing that stonemarten live in Yugoslavia by nature, it is understandable that an experiment was carried out. The experiment mating in captivity was successful so now we know the technology of intensive breeding of stonemarten.

In comperison to other precious furs animals breeding, the breeding of stonemarten has following advantage: providing of parent animals does not depend on possabilites of import and problems concerning the purchase of animals abroad. Due to the lack of parent animals as well as of the knowladge of technology for the moment there is no mass stonemarten breeding.

BREEDING POSSIBILITIES

It has been proved that stonemarten can be bred in captivity. Costs of mink breeding and stonemarten breeding are nearly the same. With the constant increas of demand for fur clothing and the fashion designers' wish to improve the choice of furs, during the last few years the interest in stonemarten skins has increased. That this is so shows the fact that the prices of stonemarten are the same as those of mink skins, and in some cases have topped them.

MATING

To 3-4 females comes one male. Females are kept separatly, one in a cage. Pregnancy lasts 9 months, and delivery occurs in march or april.

One delivery brings 2 to 5 youngsters, in average 3.

FEEDING

Stonemarten is a meat earer, and is fed offalls from sloughter houses, which are from time to time inriched with chicken meat.the dailyconsumption of feed for growen animals is 270 grammes, while a youngster consums cca 135 gr. The youngsters are fed after they cease sucking, when they are 6 months old.

A BREEF DESCRIPTION OF THE FUR

Stonemarten fur is highly appreciated, but due to the fact that it is rather loose, its price depends whether it is in fachion or not the coloring ranges from red-grayish, over red-brownish to the chocolate color. The fur is more worth the darker it is or the more bluish shine it has. The hairs on the chin and chest are white. Legs and tail are usuially dark brown, while ears are of a lighter coloring. The

hairs on the back are not very thickly planted so when the animal moves the lower white hair shines in a bluish shine, which is the characteristic of the stonemarten fur.

POSSIBLE FARM CAPACITY

5000 skins / year from
1700 parent females and
500 parent males.

Mr Gunnar Jørgensen
NJF's Fur Animal Division,
Scientifur,
48 M, Roskildejev,
DK-3400, Hilleraed
Denmark

СССР г.Петрозаводск
Первомайский пр.,6, кв.8
В.А.Берестов

Dear Mr Jørgensen,

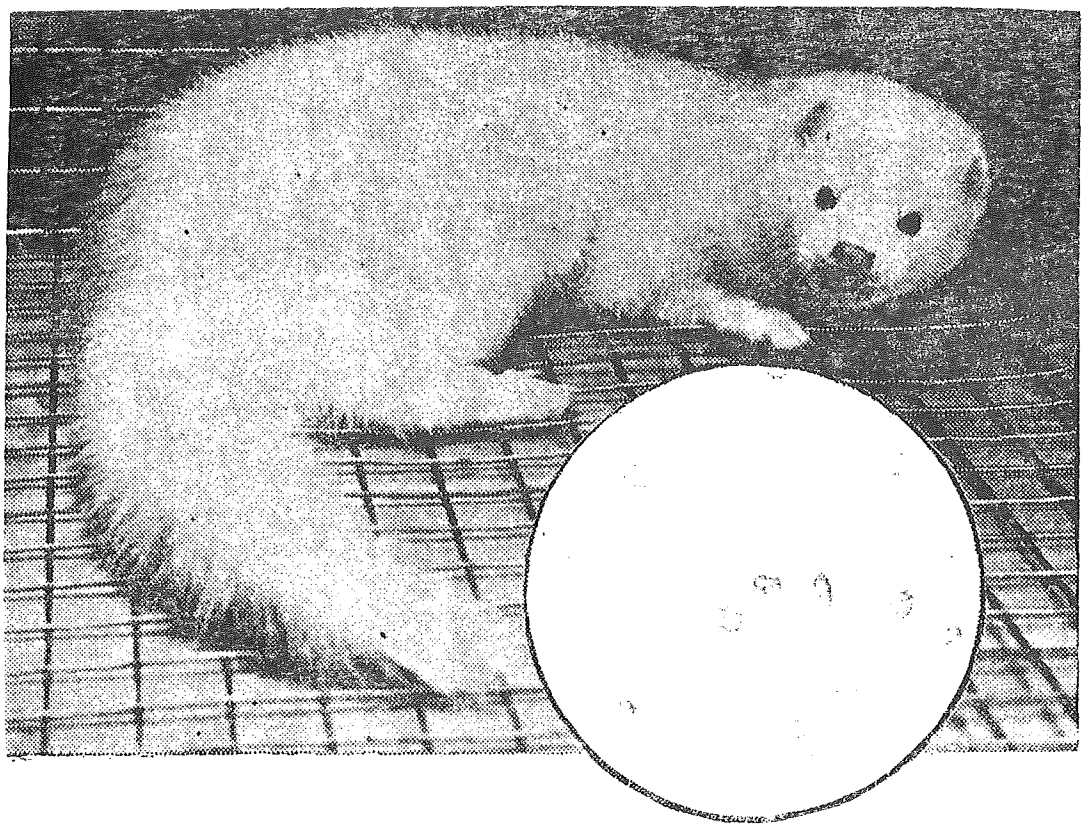
Thank you very much for the publication of our papers and information on our books in "Scientifur". We are very glad to cooperate with you and we shall maintain these contacts in the future.

I'm sending you our new book "Toxoplasmosis" in fur-bearing animals". I hope that this information will attract fur-bearers' attention to the problem of toxoplasmosis in fur-bearing animals. This disease may be very common on individual farms and may cause unfavourable whelp and decreased number of newly-born kits. Fighting against this disease on fur farms is the problem to be solved in the nearest future.

Best wishes, В.Берестов

Vyacheslav Berestov

3-XI-82



КАРЕЛЬСКИЙ ФИЛИАЛ АН СССР
ИНСТИТУТ БИОЛОГИИ

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ТОКСОПЛАЗМОЗ ПУШНЫХ ЗВЕРЕЙ

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Б48 Токсоплазмоз пушных зверей.— Петрозаводск: Карелия, 1982.—112 с., нл. Библиогр.: с. 98—111.

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Токсоплазмоз — тяжелое паразитарное заболевание животных и человека, имеющее широкое распространение во многих странах мира. В сельскохозяйственной практике токсоплазмоз наносит большой ущерб звероводству и животноводству и представляет опасность для лиц, занятых в этих производствах.

В книге излагаются современные сведения о возбудителе токсоплазмоза, его распространении среди различных видов животных в Карелии; представлены материалы по клинике токсоплазмоза у пушных зверей, влиянию его на генеративную функцию и обмен веществ. Подробно описываются методы лабораторной диагностики токсоплазмоза, дается оценка их диагностической ценности.

Книга представляет интерес для ветеринарных врачей, зоотехников, работников диагностических лабораторий, студентов и преподавателей ветеринарных вузов и техникумов.

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V.A. Berestov,

V.D. Melnikov

Toxoplasmosis in Fur-bearing Animals.

Toxoplasmosis is a serious parasitogenic illness of animals and human beings which is common throughout the world. Toxoplasmosis causes great damage to fur farming and cattle-breeding and is very dangerous to people working in these industries.

Some current information on the pathogene of toxoplasmosis, its distribution among various animal types in Karelia is given in this book. Some data on the clinical picture of toxoplasmosis in fur-bearing animals, its influence on the generative function and metabolism are presented. Methods of the laboratory diagnosis of toxoplasmosis are described in detail and its diagnostic value is estimated.

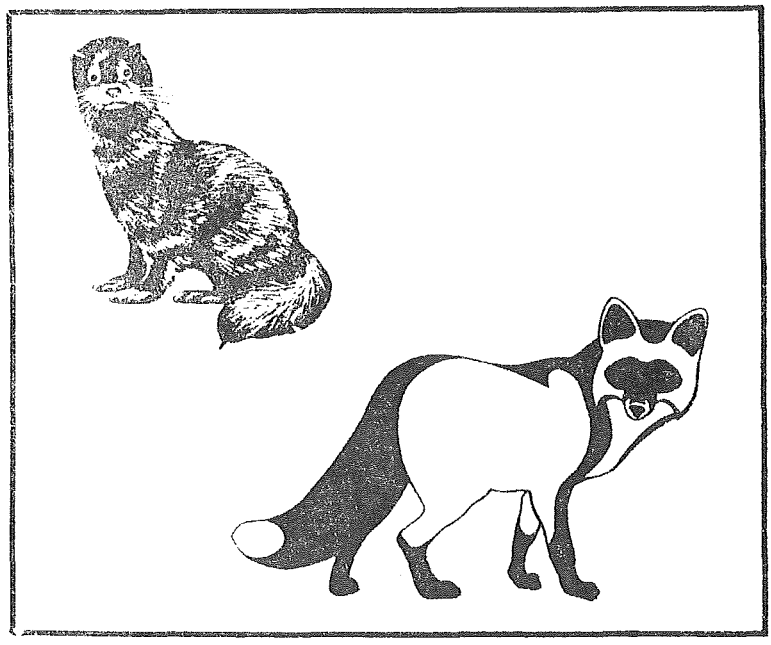
The book is of great interest for veterinaries, zootechnicians, workers of diagnostic laboratories, students and teachers of high and secondary veterinary schools.

Contents.

Sixth Annual Short Course
Fort Wayne, Indiana
August 11, 1982

MINK & FOX FARMING TODAY

- John Bennett
- Rendle Bowness
- Clinton Clark
- Gordon Finley
- Edwin Hahn
- Gilbert Holmes
- Bruce Hunter
- Hazel & Romayne Slack



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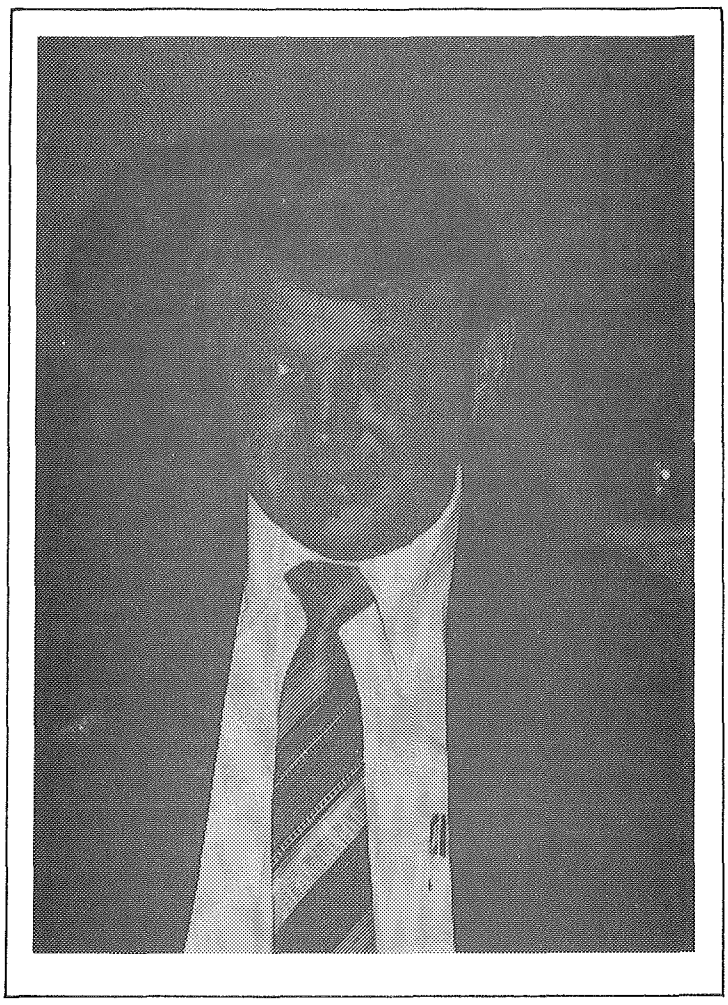

CONGRATULATIONS

Mr. Gunnar Jørgensen, Head of Department of the Fur Animal Division at the National Institute of Animal Science in Denmark and Editor and Initiator of SCIENTIFUR, will celebrate his 50 years birthday on the 17th April, and on the 1st May he will have worked at "Trollesminde", the National Institute of Animal Science, for 25 years.

I think all agricultural scientists will join me in congratulating you and wishing you many happy and fruitful years more in the field of fur animal production, where you have had so much success during the last 25 years. Much progress in mink feeding has its basis in your ideas. This fact is too often forgotten. However, I think that we now have an excellent opportunity to recall it.

When "The Big Bad Wolf" of fur breeding in the First International Congress in Helsinki 1976 howled out his idea of SCIENTIFUR, there were probably many who did not believe in it. Today we know what it has become an excellent and valuable review of the scientific literature in our special field. Gunnar, without your impulsive work as the editor, SCIENTIFUR would not exist. In your hands we can even trust in its future. On behalf of the readers of SCIENTIFUR the Board of the Division of Fur Animal belonging to the Scandinavian Association of Agricultural Scientists and last, but not least, as a former member of your staff I want to thank you for your work for the fur animal production.

I am sure that all of us who know you wish you a happy birthday and congratulate you on your anniversary.

Niels Glem-Hansen.