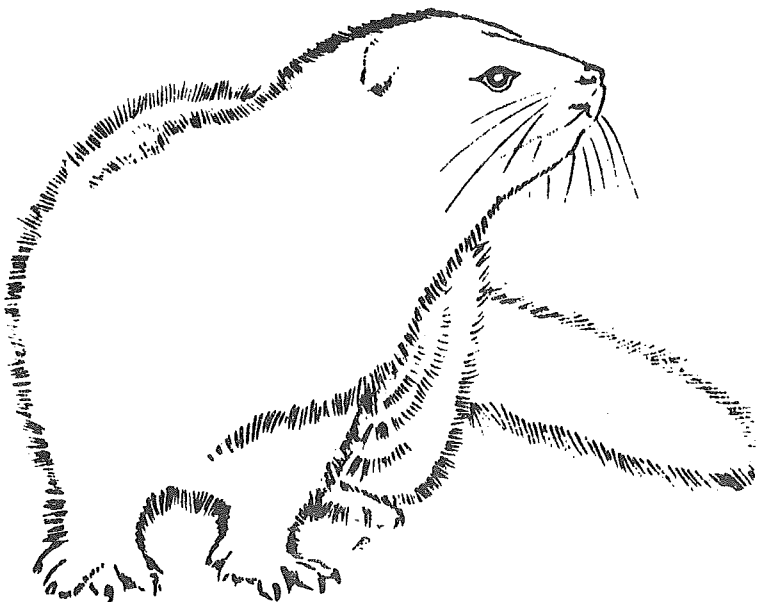


SCIENTIFUR
No. 1, February 1978.

Contents.

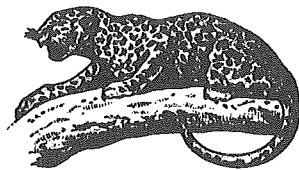
1. CONTENTS	1 - 3
2. NOTES.	4 - 6
3. <u>MULTIDISCIPLINARY.</u>	
ENDOTOXIN-INDUCED EMBRYONIC DEATH IN MINK. O. Möller.	7
ON THE POSTNATAL DEVELOPMENT OF THE BRAIN OF PROCYON CANCRIVORUS CANCRIVORUS (PROCYONIDAE; MAMMALIA). D. Kruska.	10
ON THE POSTNATAL DEVELOPMENT OF THE BRAIN OF THE FARM MINK MUSTELA VISON F. DOM. (MUSTELIDAE; MAMMALIA). D. Kruska.	12
SOME MORPHOLOGICAL DIFFERENCES BETWEEN THE HEAD BONES OF THE FOX (VULPES VULPES) AND DOG (CANIS FAMILIARIS). S. Popović.	13
SOME CHARACTERISTICS OF THE BONES OF THE ANTERIOR EXTREMITIES IN THE FOX (VULPES VULPES) AND DIFFER- ENCES RELATING TO THE BONES OF THE ANTERIOR EXTRE- MITY IN THE DOG (CANIS FAMILIARIS). Sreten Popović.	14
CORRELATIONS BETWEEN REPEATED MEASUREMENTS AND PELT GRADINGS OF DARK MINK. Jostein Reiten.	15
CORRELATIONS BETWEEN SIZE AND PELT CHARACTERISTICS OF DARK MINK. Jostein Reiten.	16

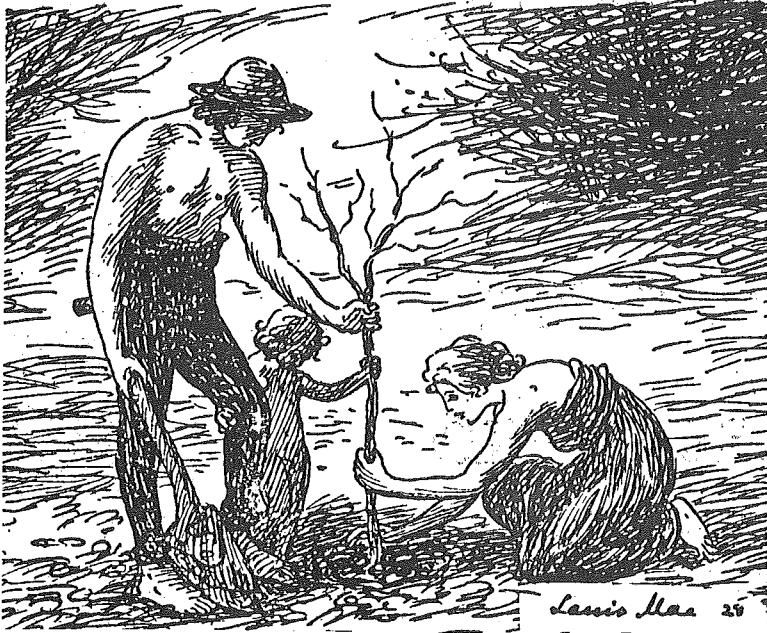


SCIENTIFUR
ISSN 0105-2403
Vol. 2, No. 1.
February 1978.

DRIED MINK MANURE AS A FEED INGREDIENT FOR LAYING HENS. Maija-Liisa Salo.	18
Editor's cut outs.	19
4. <u>REPRODUCTION.</u>	
AN ANGIOGRAPHIC STUDY OF THE FOX TESTIS IN VARIOUS STAGES OF SEXUAL ACTIVITY. M. Joffre, M. Kormano.	20
THE TESTICULAR CAPSULE OF THE WILD RED FOX (VULPES VULPES): RELATIONSHIP WITH TESTICULAR ACTIVITY DURING THE PREPUBERAL PERIOD AND THE SEASONAL CYCLE. M. Joffre.	21
BLOOD CIRCULATION IN THE TESTIS OF THE ADULT WILD RED FOX (VULPES VULPES): INVOLVEMENT OF THE TESTICULAR CAPSULE AND SEPTA IN THE SEASONAL CHANGES OF TESTICULAR VASCULATURE AND CAPILLARY BLOOD FLOW. M. Joffre.	23
RELATIONSHIP BETWEEN TESTICULAR BLOOD FLOW: TESTOSTERONE SECRETION AND SPERMATOGENIC ACTIVITY IN YOUNG AND ADULT WILD RED FOXES (VULPES VULPES). M. Joffre.	25
THE USE OF SERUM GONADOTROPINS TO PROVOKE HEAT IN ANAPHRODIASIAIC FEMALE MINKS (LUTREOLA VISON). J. Konrád, J. Mouka, J. Hanák.	26
THE INFLUENCE OF VARIOUS MATING SYSTEMS UPON FERTILITY OF FEMALE MINKS. J. Maciejowski, J. Slawoń, S. Brzozowski.	27
INVESTIGATIONS INTO THE INFLUENCE OF BODY WEIGHT ON THE FERTILITY OF THE MINKS. J. Maciejowski, G. Jeżewska.	28
DIURNAL ACTIVITIES OF MINK FEMALES DURING PREGNANCY, AT LITTER TIME, AND SUCKLING PERIOD. F. Kukla, K. Kostroň.	29
RESULTS OF AN INFORMATIVE MINK TESTICLE TESTING DURING THE PRE-MATING SEASON. K. Kostroň, F. Kukla.	30
THE SEASONAL CHANGES OF THE MINK'S TESTICLE VOLUME. K. Kostroň, F. Kukla.	32
5. <u>GENETIC.</u>	
INVESTIGATIONS CONCERNING SELECTION FOR FUR CRITERIA IN MINKS. G. Benthin.	34
HERITABILITY ESTIMATES FOR SIZE AND PELT CHARACTERISTICS OF DARK MINK. J. Reiten.	35
6. <u>NUTRITION.</u>	
KIDNEY CONCREMENTS IN MINK AFTER FEEDING FISH ENSILAGE. A. Helgebostad, R. Svenkerud.	37
THE FORMALDEHYDE CONTENT IN FISH IN RELATION TO ANEMIA IN MINK. A. Helgebostad, I.W. Dishington.	37

THE UTILIZATION OF HYDROLYZED NITROGEN WASTE IN THE NUTRITION OF FUR-BEARING ANIMALS. F. Mikoška, M. Macková, K. Otevřelová.	39
INFLUENCE OF FEEDING WITH FODDERS CONTAINING BY-PRODUCTS OF FEMALE REPRODUCTIVE ORGANS; FISH MEAT AND VARIOUS KINDS OF FAT ON FERTILITY AND FECUNDITY OF MINK. S. Jarosz, J. Barteczko.	39
7. <u>VETERINARY SCIENCE.</u>	
FAT CELL NECROSIS IN THE FATTY LIVER SYNDROM IN MINK. G.M. Dorrestein, L.H.J.C. Danse.	41
SEROLOGICAL INVESTIGATIONS IN THE DIAGNOSTICS OF TUBERCULOSIS OF MINKS. J. Ocetkiewicz, J.W. Stefan, H. Wojtacha.	42
AN ATTENUATED MINK ENTERITIS VIRUS AND ITS USE IN A TRIVALENT VACCINE: STUDIES ON SAFETY AND ANTIGENICITY. I. Vacek, K.F. Lawson, W.A. M. Gregg.	43
PATHOLOGIC ANALYSIS OF MINK MORTALITY IN NEW ENGLAND MINK. M.A. Friedman, F.D. Friffith, S. Woods.	44
DETECTION OF INAPPARENT ALEUTIAN DISEASE VIRUS INFECTION IN MINK. S.H. An, D.G. Ingram.	45
SUSCEPTIBILITY OF FOXES TO CLOSTRIDIUM BOTULINUM TYPE C AND E TOXINS. M. Yndestad, A. Helgebostad, G. Loftsgård.	46
THE POSSIBILITIES OF COMBINES VACCINATION OF MINKS AGAINST AUJESZKY'S DISEASE, RABIES AND BOTULISM. J. Konrád, J. Mouka, R. Dvořák, J. Hanák.	46
THE CLINICAL AND ETIOLOGICAL ASPECTS OF UROLITHIASIS IN MINKS (LUTREOLA VISON). J. Konrád, J. Hanák, J. Mouka.	47
THE CLINICAL EVALUATION OF SOME METHODS OF THE USE OF DRUGS FOR THE IMMOBILIZATION OF MINKS (LUTREOLA VISON). J. Konrád, J. Hanák, J. Mouka.	48
8. COMMUNICATION.	50 - 53





NOTES
 SCIENTIFUR
 Vol.2, no.1.
 February 1978.

In this issue of SCIENTIFUR we have been able to bring 36 contributions of a scientific nature, of which one is an original report. We must admit however, that we have had to include some rather old reports which I was given by colleagues I met in the course of a very interesting study tour of Poland and Czechoslovakia.

The reason for printing so many "elderly" reports is of course that we have received all too few contributions, and our deliberations on the future of SCIENTIFUR, must therefore be based not only on the economic problems, but also on how much responsibility the individual researcher will take to ensure that we have material to publish. We should be able to count on receiving abstracts or originals of all scientific reports concerning fur bearers. The end of 1978 is the deadline for deciding the fate of SCIENTIFUR so if you are interested in its continuation, please send contributions and names of potential subscribers. See under Communication.

SCIENTIFUR will deck mainly the farm-produced fur-bearers, of which mink and fox dominate - as yet. It is therefore natural to place SCIENTIFUR's economy in relation to production of mink and fox skin. World production of mink and fox

skin (for export) approximately 21 million skins (1 fox = 2 mink). The budget for SCIENTIFUR in 1979 is expected to be 60.000 Dkr. This budget can be covered by the sale of 300 subscriptions at 200 Dkr. each.

The subscribers also expect something for their money, so we have to print at least 40 abstracts or original reports per issue, or 160 in a year. And we cannot print these unless we receive them.

If we place number of subscribers and contributors in relation to skin export in the various countries, we obtain the following picture.

Country	Million skin produced	Number subscribers		Number contributors	
		Exp- ected	Obt- ained	Exp- ected	Obt- ained 1977
Finland	4.2	60	18	30	4
Denmark	3.9	56	39	28	14
USA	3.0	43	11	20	18
USSR	2.6	37	0	18	3
Norway	1.4	20	16	10	7
Sweden	1.3	19	8	9	5
Canada	0.9	13	13	7	15
Poland	0.6	9	1	5	3
China	0.6	9	2	5	0
Holland	0.55	9	9	5	1
Japan	0.38	5	2	2	2
East Germany	0.35	5	1	2	1
England	0.33	5	3	2	0
France	0.21	3	5	2	2
West Germany	0.16	3	2	2	2
Belgium	0.08	2	6	1	0
Czechoslovakia	0.05	4	5	12	10
Argentina	0.04				
Italy	0.04				
Iceland	0.03				
Other					
Sum	20.8	302	141	160	97

From this review it can be clearly seen how much support SCIENTIFUR should be able to expect from each individual fur producing country, if we can agree on skin production to export as a suitable measuring instrument.

We must say "hats off" to Canada which from the SCIENTIFUR point of view is the leading country in the world. At the same time we urge the fur-producers organizations in the other countries to spread the word about SCIENTIFUR, so that all involved in consultant work, research or teaching about fur production, have access to - ALL RESEARCH IN FUR ANIMAL PRODUCTION.

Please draw the attention of educational institutions, research centres, the feedstuff industry and all those interested, to SCIENTIFUR. Better still, send us the list you will find under "Communication" with names and addresses of persons or institutions whom you think will be interested in receiving this issue of SCIENTIFUR.

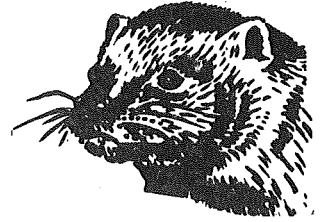
Last but not least I will urge the leading institution for fur bearer research in each land to make a survey of the extent of research in their country. We imagine that such a survey could include information as to how many are engaged in research, and the economic framework in which they operate - how much support they receive from government and how much from Associations or funds - and of course, what projects are under way at the moment. A short report with this information would be very welcome at SCIENTIFUR, and we could probably manage to get round everyone before the next world congress in 1978-79.

WE MUST HELP EACH OTHER, BECAUSE WE MUST SURVIVE: THE FUR ANIMAL PRODUCTION, THE FUR ANIMAL RESEARCH AND SCIENTIFUR.

With optimistic regards


Your Editor

ORIGINAL PAPER



★ ENDOTOXIN-INDUCED EMBRYONIC DEATH IN MINK

O. Möller, Department of Husbandry and Genetics, Research Station for Fur-Bearing Animals, Heggedal, and K. Nordstoga, Department of Pathology, Veterinary College of Norway, Oslo.

INTRODUCTION

The causal background of fertility problems which exist in mink breeding at present is probably of complex nature, and single factors are difficult to evaluate. A considerable number of females, which, after normal mating do not deliver, have, however, obviously conceived as implantation zones are relatively often found in the uterus (K. Nyberg, personal communication); this observation indicates that embryonic death or abortion has occurred.

It is well known from experiments with other species that bacterial endotoxins may provoke embryonic death or abortion (Coid, 1976, Rieder & Thomas, 1960). Endotoxins constitute integral components of the cell walls of Gram negative bacteria, from which they are liberated when the cells die. They are toxic principles, with a wide variety of actions in experimental animals. The ready-mixed feed ordinarily used for fur animals, probably contains large amounts of endotoxins, and probably increasing amounts, with increasing numbers of bacteria. It is clear, therefore, that mink and foxes, more than other species of domestic animals, are exposed to endotoxins through the feed; field observations also indicate that there sometimes is a connection between the hygienic quality of the feed and reproductive results. In the present investigation the effects of exogenous application of bacterial endotoxin on reproduction in mink were studied.

MATERIALS AND METHODS

The animal model consisted of 52 mated female breeders of the Standard type; the animals were allocated to 2 groups which were as similar as possible as to ages, previous reproductiveness, time of mating and number of matings. All females in the experiment group (n = 26) received a subcutaneous injection of 10 mg endotoxin (E.coli 026 : B 6, Difco Laboratories, Detroit, Mich., U S A), dissolved in 2 ml sterile isotonic saline. The injections were given 11 - 21 days post coitum, estimated after the first date of mating. Control animals were injected subcutaneously with 2 ml isotonic saline.

RESULTS AND DISCUSSION

Several of the experiment females refused their feed on the first and/or second day after the inoculation, but were otherwise unaffected of the treatment.

TABLE 1

Breeding results after a single injection of 10 mg endotoxin dissolved in 2 ml saline (experimental group) 11 - 21 days post coitum. The control group received 2 ml sterile saline at corresponding times.

	Experimental group (n = 26)	Control group (n = 26)	Significance (Wilcoxon's group test and t-test)
"Empty" females	8	3	P > 0.05 (n.s.)
Kits/mated female	3.0 ± 3.1	5.2 ± 2.7	P < 0.01
Kits/female which delivered	4.3 ± 2.9	5.8 ± 2.6	P > 0.05 (n.s.)
Females with litter ≤ 5 (O-litter included)	19	11	P < 0.05
Females with litter ≤ 5 (O-litter excluded)	11	8	P > 0.05 (n.s.)
Females with litter > 5	7	15	P < 0.03

The results of this study indicate that embryonic death may be induced by the injection of endotoxin into pregnant mink. It has not been documented, however, that endotoxin is resorbed from the intestinal tract in healthy individuals of any species, although it seems possible that this may occur in association with various intestinal disorders, which imply disturbances in the intestinal barrier. Abortion is, however, known to occur in connection with a variety of infections caused by Gram negative bacteria; it has been claimed that, at least the earliest morphological placental changes associated with some of these infections are identical with those occurring in endotoxin-induced abortion (Hall, 1973). Thus, there is reason to believe that the pathogenetic mechanism involved in abortions provoked by Gram negative bacteria may be, at least partly, related to the bacterial content of endotoxins. Endotoxins have a variety of "toxic" properties in experimental situations, including a noxious effect on the blood circulation, especially on minute vessels, where the exchange of fluid and metabolic products between the circulating blood and the tissues occurs (capillaries or microcirculatory vessels). The effects of endotoxins on minute vessels include endothelial lesions, excessive dilatation, disturbances in the permeability etc. The small vessels are blocked by stagnant red blood cells, resulting in cessation of blood flow and ensuing ischaemic necrosis. This phenomenon, called true stasis, is described in association with endotoxin-induced abortion in small laboratory animals (Hall).

Our investigation did not include morphological studies, but it seems probable that the pathogenetic mechanism was analogous in the present experiment. It has also, however, been shown that nutritional factors (lack of vitamin B₆) may contribute to absorption sterility in mink (Helgebostad & Svenkerud, 1963). The possibility also exists that more synergistic factors may be involved. Thus, it has been demonstrated that pigs deficient in vitamin E are especially vulnerable to endotoxin (Teige et al., 1973).

REFERENCES

- Coid, C.R.: Bacterial endotoxin and impaired fetal development. *Experientia* 32, 735 - 736, 1976.
- Hall, G.A.: Changes in rat placenta following inoculation with Salmonella dublin. *Amer. J. Path.* 72, 103 - 114, 1973.
- Helgebostad, A., Svenkerud, R. & F. Ender: Sterility in mink induced by deficiency of vitamin B₆. *Acta vet. scand.* 4, 228 - 237, 1963.
- Rieder, R.F. & L. Thomas: Studies on the mechanism involved in the production of abortion by endotoxin. *J. Immunol.* 84, 189 - 193, 1960.
- Teige, J. jr., Nordstoga, K., Fjølstad, M. & I. Nafstad: The generalized Shwartzman reaction in pigs induced by diet and single injection of disintegrated cells or partially purified endotoxin from Escherichia coli. *Acta vet. scand.* 14, 92 - 106, 1973.

★ ON THE POSTNATAL DEVELOPMENT OF THE BRAIN OF PROCYON CANCRIVORUS CANCRIVORUS (PROCYONIDAE; MAMMALIA).

(Über die postnatale Hirnentwicklung bei *Procyon cancrivorus cancrivorus* (Procyonidae; Mammalia)).

D. Kruska, Institut für Zoologie der Tierärztlichen Hochschule,
D-3000 Hannover, Bischofsholer Damm 15.

During the postnatal development the relation between brain size and age as well as between brain and body size is investigated in 55 crab-eating racoons. Approximately 70 days post natum the brain has reached its final size. The multiplication factor of brain size (see Portmann and Mangold-Wirz) is found to be 14 and according to this we can classify *Procyon cancrivorus cancrivorus* as an insessorial (heterophagous) mammal. The relation

between brain and body weight during postnatal ontogenesis can be described by two allometric lines with different slopes. Individual and intraspecific (= interindividual) allometries are discussed.

Furthermore the postnatal morphogenesis of the brain is described at different stages of development. 1 day old individuals of the investigated subspecies have brains which, like those of Ursidae, are similar to the late embryonic phase in other mammals. Heterogeneous development stages become clear. This is discussed in connection with the results of postnatal ontogenesis in behaviour.

Z. f. Säugetierkunde, Bd. 40, 1975, H.4, 243-256.

1 table, 4 figs., 3 photos, 21 references.

(German with english summary)

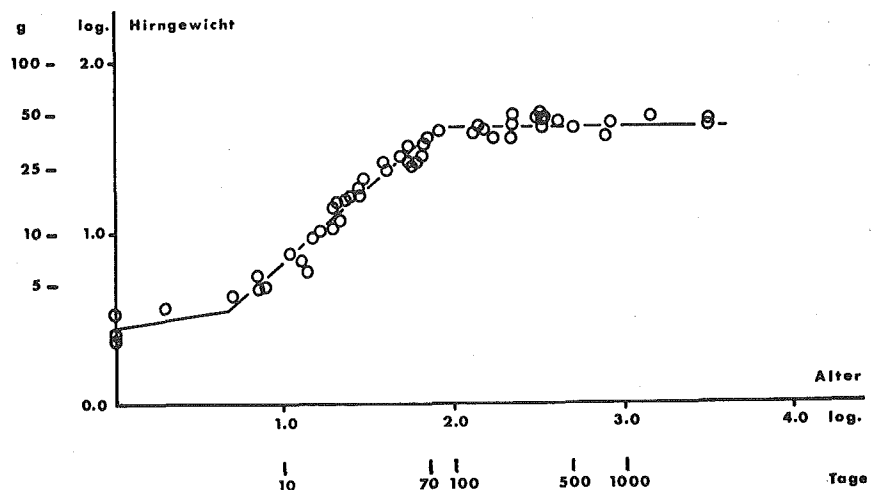


Abb. 1. Hirngewichte von *Procyon cancrivorus cancrivorus* während der postnatalen Ontogenese in Abhängigkeit vom Alter
D. Kruska

Authors summary.

★ ON THE POSTNATAL DEVELOPMENT OF THE BRAIN OF THE FARM MINK *MUSTELA VISON F. DOM.* (MUSTELIDAE; MAMMALIA).

(Über die postnatale Hirnentwicklung beim Farmnerz *Mustela vison f. dom.* (Mustelidae; Mammalia).

D. Kruska, Institut für Zoologie der Tierärztlichen Hochschule Hannover, Bischofsholer Damm 15, D-3000 Hannover.

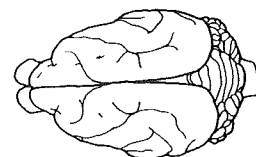
In 119 brains of male and female farm minks at different postnatal age from 1/2 day to 5 1/2 years the development of the central nervous system is characterized. The analysis of the relations between body weight, brain weight and age points to postnatal retardation in growth of both, body and brain, until the 3./4. day. Not till then a rapid increase of development can be observed. At the age between 5 and 7 months the brain weight decreases in male and female farm minks by 14% and 18% respectively. This phenomenon is discussed in connection with possible differences in biochemical composition between juvenil and adult brains and in connection with effects due to domestication.

Furthermore postnatal morphogenesis of the brain is described at different stages of development. Brains of neonate farm minks show an extraordinary inferior degree of development. These brains resemble earlier embryonic stages of other placental mammals. This fact and a multiplication factor as high as 25 characterizes farm minks as extreme insessorial mammals. Confrontations of neonate and adult brains of some ursid, procyonid and mustelid species confirm the rule of precedence described by Portmann (1962) within the group of arctoid carnivores.

Z. f. Säugetierkunde, Bd. 42, 1977, H.4, 240-255.

2 tables, 5 figs, 3 photos, 25 references.

(German with english summary).



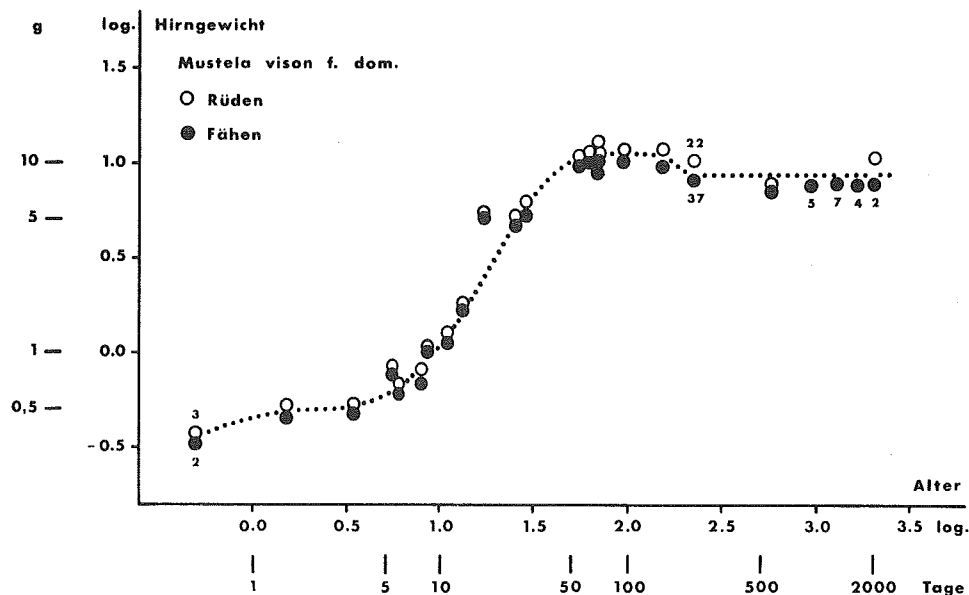


Abb. 2. Hirngewichte von männlichen und weiblichen Farmnerzen während der postnatalen Ontogenese in Abhängigkeit vom Alter. Die Zahlen an den Symbolen geben die Anzahl von Tieren gleichen Alters an. Die Hirngewichtsschwankungen überschreiten in solchen Fällen nicht die Größe der Symbole

D. Kruska

Authors summary.

- ★ SOME MORPHOLOGICAL DIFFERENCES BETWEEN THE HEAD BONES OF THE FOX (*VULPES VULPES*) AND DOG (*CANIS FAMILIARIS*) (Neke morfološke razlike kostiju glave lisice (*Vulpes Vulpes*) u odnosu na kosti glave psa (*Canis Familiaris*)).

S. Popović, Katedra za anatomiju, Veterinarski fakultet, Bulevar JNA 18, 11000 Beograd, Jugoslavija.

The highest position of the side profile in the dog is in the middle part of the frontal bones and in the fox in the region of the parietal bones. In the fox the narrowest part of the frontal bones is immediately by the caudal border of the processus zygomaticus and in the dog by the apical border of the parietal bones. The surface of the frontal bones between both processus zygomatici is mainly even in foxes but in dogs it is convex. The dorsal side of the processus zygomaticus ossis frontalis in foxes is in the form of a right-angled triangle with a slightly depressed surface while in dogs it is shaped like an isosceles triangle with a convex surface. The top of the processus zygomaticus in dogs is slightly curved while in foxes it is very

sharp. Besides the mentioned characteristics there is also a description of some other less important features.

Acta Veterinaria, Beograd, Vol. 22, 1972, no.6, 279-284.

4 photos, 5 references.

(English with yugoslavish summary).

Authors summary.

★ SOME CHARACTERISTICS OF THE BONES OF THE ANTERIOR EXTREMITIES IN THE FOX (*VULPES VULPES*) AND DIFFERENCES RELATING TO THE BONES OF THE ANTERIOR EXTREMITY IN THE DOG (*CANIS FAMILIARIS*).

(Odluke kostiju prednjeg ekstremiteta lisice (*Vulpes Vulpes*) i razlike u odnosu na kosti prednjeg ekstremiteta psa (*Canis Familiaris*)).

Sreten Popović, Anatomski Institut, Veterinarski fakultet, Beograd, Yugoslavia.

By comparative morphological investigations there were established big similarities as well as some important differences between the bones of the anterior extremities of the fox and dogs.

Some characteristic differences can be found in the scapula and humerus, which, in lower or higher degree, can be used for their differentiation. However, ossa antebrachii, ossa carpi, ossa metacarpi, phalanges digitorum and ossa sesamoides of the fox are so similar to the same bones of the dog that practically there are almost no differences between them or these differences are so small that are insufficient for their differentiation.

Acta Veterinaria, Beograd, Vol. 23, 1973, Suppl., 133-138.

8 photos, 5 references.

(Yugoslavish with english summary).

Authors summary.

★ CORRELATIONS BETWEEN REPEATED MEASUREMENTS AND PELT GRADINGS OF DARK MINK.

(Korrelasjoner mellom gjentatte målinger og vurderinger av pelsegenskaper hos mørk mink.)

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

The objectives of the present investigations were to find the correlation between various traits of summer fur and winter fur in mink. Besides, repeatability of pelt grading and differences in pelt characteristics between sexes were investigated. The investigations include all dark mink produced at the Agricultural University of Norway during the years 1972-1975, totally about 5000 animals.

The repeatability of pelt grading was determined as the correlation between two independent gradings of the same traits by the same person. The results showed a repeatability of 0.7-0.8 for grading of colour shade, and 0.5-0.7 for pelt quality traits as density of fur, hair quality, and hair elasticity, and pelt defects as metallic, crinkled guard hairs, and singe. Traits measured more objectively showed some higher repeatability: skin length (cm) and skin weight (g) approached 1.0, hair length (mm) and thickness of leather (0.1 mm) 0.7-0.8. The coefficients for females were generally lower than for males.

The correlation coefficients between traits of summer fur of live animals in August and winter fur of live animals in November and of skins varied between 0.1 and 0.3, highest for colour shade, lowest for length of underfur. The correlation between judgement of winter fur of live animals in November and of skins was higher, the coefficients being between 0.2 and 0.6.

Significant differences between sexes were found for the traits skin length, skin weight, leather thickness and hair length. There was no clear tendency towards pelt quality traits being

influenced by sex. It seemed, however, that hair elasticity was better in males while hair quality was better in females. The males had more of the pelt defects metallic, crinkled guard hairs, and wet belly, while the females had more singe.

Meldinger fra Norges Landbrukshøgskole, Vol. 56, 1977, no. 14.
8 tables, 12 references.

(Norwegian with english summary and subtitles).

Authors abstract.

★ CORRELATIONS BETWEEN SIZE AND PELT CHARACTERISTICS OF
DARK MINK.

(Korrelasjoner mellom størrelse og pelsegenskaper hos
mørk mink.)

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

The present investigation includes dark mink kits produced at the Agricultural University of Norway during the years 1972-1975, totally about 5000 animals corresponding to ca. 3700 skins. The objective of the investigation was to find phenotypic correlations between measures of size and a series of pelt characteristics of mink.

Phenotypic correlations between most of the pelt characteristics are low, and they generally varies between -0.2 and $+0.2$. There also is a variation in the coefficients between years.

However, relatively high positive correlations have been found between skin length, skin weight, and leather thickness ($r=0.6-0.8$) for both sexes. Correlations of the same size have also been found to exist between crinkled guard hairs and metallic, and between length of guard hairs and length of underfur.

Correlation calculations show that large skins generally have lower pelt quality than smaller skins ($r \approx -0.15$). They also

have more of the pelt defects metallic and crinkled guard hairs ($r \approx 0.3$ for males). These two pelt defects seem to appear more often on relatively dark skins ($r \approx -0.2$). Apart from that, colour shade seems to be relatively independent of the other pelt characteristics.

Long underfur seems to be connected with dense fur and good hair quality ($r \approx 0.2$). Long guard hairs are mostly found in pale skins ($r = 0.1-0.2$), and skins with long guard hairs seems to singe more easily than the shorthaired types ($r \approx 0.2$). Metallic is more common in the types with short guard hairs ($r \approx -0.2$).

General pelt quality is the resultant of a series of pelt characteristics and is in the present investigation found to be positively correlated ($r = 0.2-0.4$) with fur density, long underfur, hair quality, and hair elasticity. The pelt defects metallic, crinkled guard hairs, and wet belly reduce the pelt quality ($r \approx -0.2$).

By grading the winter fur of live animals correlation coefficients of the same size as by skin grading have been found between corresponding characteristics. The correlation between body weight and body length is about 0.65. Skin length and body length at pelting show a correlation of about 0.7 for males and 0.6 for females. The correlation between skin length and body weight at pelting is about 0.85 and 0.75 for males and females respectively.

A calculation of the degree of fatness of the mink shows, however, that body length is of greater importance for skin length than is the degree of fatness. The body length of the animal seems to have small influence on most of the pelt quality traits, while degree of fatness seems to have negative influence on both fur density, hair length, and hair quality.

Meldinger fra Norges Landbrukshøgskole, Vol. 56, 1977, no.15.
6 tables, 19 references.

(Norwegian with english summary and subtitles).

Authors abstract.

DRIED MINK MANURE AS A FEED INGREDIENT FOR LAYING HENS



Maija-Liisa Salo

Dept. of Animal Husbandry, University of Helsinki
00710 Helsinki 71, Finland

The use of dried mink manure was preliminarily studied with two groups of laying hens (á 62 birds) for 24 weeks. In an experimental feed soybean meal was substituted with 5 % dried mink manure (group 1) or with 5 % manure plus 3 % whole poppy seed (group 2). All experimental diets were isocaloric and isonitrogenous, furthermore the contents of lysine and S-amino acids were equal. As an extra control was a commercial feed, which had a higher values of energy and protein.

On average there were no significant differences between the experimental and control groups in egg production, in the weight of egg or in the utilization of feed per kg eggs. The experimental group 2 was fully equal with the group receiving commercial feed. Mink manure had no influence on the taste or quality of the eggs.

The batch of mink manure investigated was badly contaminated with soil and straw. It contained about 33 % ash, 13 % crude fibre and 23 % crude protein of DM. The figures for pure mink manure are about 8, 3 and 35 %, respectively. In despite of the poor quality of the manure the results of the preliminary trial were very promising.

Siipikarja 1977 No. 10, 246-248
3 tables, 3 references.

Authors abstract





ASCORBATE AND CHEDIAK-HIGASHI SYNDROME

Oral administration of 200 mg ascorbic acid daily for two months restored normal chemotaxis, degranulation and bactericidal activity to leukocytes taken from a patient with Chediak-Higashi syndrome. Improved function was accompanied by a return of greatly elevated levels of cyclic AMP to near normal values.

Key Words: ascorbate, cyclic nucleotides, Chediak Higashi syndrome, leukocytes

Chediak-Higashi syndrome is a rare inherited disorder of humans with homologues in the Aleutian mink, a strain of Hereford cattle and a beige mutant of the C 57 black mouse. It is characterized by pigmentary dilution, increased susceptibility to pyogenic infections and the presence of anomalous giant granules resembling lysosomes in leukocytes and other cell types. The increased susceptibility to infec-

Literature used:

1. J. A. Sandler, J. I. Gallin and M. Vaughan: Effects of Serotonin, Carbamylcholine and Ascorbic Acid on Leukocyte Cyclic GMP and Chemotaxis. *J. Cell Biol.* 67: 480-484, 1975
2. L. A. Boxer, A. M. Watanabe, M. Rister, H. R. Besch, Jr., J. Allen and R. L. Baehner: Correction of Leukocyte Function in Chediak-Higashi Syndrome by Ascorbate. *New Engl. J. Med.* 295: 1041-1045, 1976
3. R. D. Estensen, H. R. Hill, P. G. Quie, N. Hogan and N.D. Goldberg: Cyclic GMP and Cell Movement. *Nature* 245: 458-460, 1973
4. A. H. Nathans and A. E. Kitabchi: Effect of Ascorbic Acid on ACTH-Induced Cyclic AMP Formation and Steroid Genesis in Isolated Adrenal Cells of Vitamin E-Deficient Rats. *Biochem. Biophys. Acta* 399: 244-253, 1975

170 NUTRITION REVIEWS / VOL. 35, NO. 7 / JULY 1977

Nutrition Abstracts and Reviews - Series B 1977 Vol. 47

SPRUZH, YA.; LUTINSKIY, S.; ZABUTYI, A.; ROMYSLOV, P. [Diludin in feeds for young mink.] Diludin - v ratsionakh shchenkov. *Krolikovodstvo i Zverovodstvo* (1975) No. 6, 24-25 [Ru]

7046 USATOV, YU. S. [Shrimp in a diet for mink.] Kril' v ratsione norok. *Krolikovodstvo i Zverovodstvo* No. 2, 15-16 [Ru]

7048 CHEPRASOV, V. D. [Effect of the ratio of nutrients in the diets of young mink on their subsequent reproductive performance.] Vliyaniye sootnosheniya pitatel'nykh veshchestv v ratsionakh molodnyaka norok na ikh posleduyushchuyu vosproizvoditel'nost'. *Krolikovodstvo i Zverovodstvo* (1977) No. 3, 14-15 [Ru]

7044 GLAZOV, E. M. [Energy requirement of young weiled arctic foxes.] Potrebnost' v energii molodnyaka ualevykh pestsov. *Krolikovodstvo i Zverovodstvo* (1976) No. 12-13 [Ru]



★ AN ANGIOGRAPHIC STUDY OF THE FOX TESTIS IN VARIOUS STAGES OF SEXUAL ACTIVITY.

M. Joffre and M. Kormano, CABAS (CNRS), 79360 Beauvoir-sur-Niort, Laboratoire de Physiologie Comparee, UER Sciences Fondamentales et Appliquees, 46, Avenue du Recteur Pineau 86022 Poitiers, France; and Dept. of Diagnostic Radiology, University of Turku, Finland.

The arteries and veins of the fox testis were studied using an angiographic technique. The postnatal development of the testis involved only minor modification of the vasculature. In the non-breeding season both the arteries and veins of the adult fox testis undergo extensive spiralization which completely disappears during the breeding season. When the sequence of morphological changes in blood vessels are related to available data on changes in testicular size, blood flow and connective tissue content, it is obvious that the vascular spiralizations is passive and related to shrinkage of the organ and does not primarily influence the testicular blood flow.

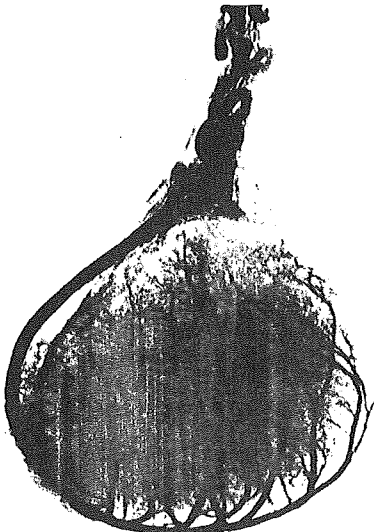
The Anatomical Record, Vol. 183, no.4, 1975.

4 photos. 6 references.

(English).

Authors abstract.

1 Arteriography of the adult fox testis in breeding season (January). $\times 3$



1



4

4 Arteriography of the adult fox testis at the stage of sexual inactivity (July). $\times 3$.

★ THE TESTICULAR CAPSULE OF THE WILD RED FOX (*VULPES VULPES*):
RELATIONSHIP WITH TESTICULAR ACTIVITY DURING THE PREPUBERAL
PERIOD AND THE SEASONAL CYCLE.

(La capsule testiculaire du renard roux (*Vulpes vulpes* L.):
relation avec l'activité testiculaire pendant la période
prépubère et au cours du cycle saisonnier.)

M. Joffre, Lab. de Physiologie comparée, Fac. des Sciences,
Parc Grandmont, F 37200 Tours, France.

Wet and dry weight total collagen content and histology of the connective structures of the testicular capsule (albuginea) and the parenchyma were studied during the prepubertal growth of the fox cub and during the adult seasonal breeding cycle.

1) Testicular capsule weight is closely related to testicular weight. It slowly increases during the impubertal period from March to September, then rapidly from October to January. A maximum value is reached at puberty in January. In the adult, this weight decreases from January to March-April; it remains stable during the resting period, then increases again until January. All these ponderal changes are closely related to the total collagen content of the capsule. However, collagen titer, which increases during impubertal and prepubertal testis growth, does not change during the seasonal cycle of the adult.

2) Total collagen content of the paranchyma increases from March to January in the testis of the fox cub. In the adult it decreases during the regressive period, then increases again from October to January. Collagen concentration decreases during the prepubertal period and adult re-growth period; during the latter, the titer increases during the regressive period.

3) Connective tissue structures are mainly found in the tunica albuginea of the capsule, the septa, blood vessel and seminiferous tubule walls and the intertubular spaces in the parenchyma. In the impubertal state, tunica albuginea, septa and intertubular tissue are characterized by numerous juvenile fibroblasts and PAS-positive material (mucopolysaccharides); collagen fibers are not abundant. During prepubertal growth there is progressive

fibrogenesis of these structures and parallel disappearance of mucopolysaccharides. At puberty, the tunica albuginea is formed by numerous coalescent fibers, some mature fibroblasts and a few smooth muscle cells. The septa contain numerous collagen fibers, and the intertubular spaces a loose connective tissue around the seminiferous tubules, the Leydig cell islands and the capillaries.

During the regressive period in the adult, the testicular capsule and septa thicken markedly, and abundant polysaccharides re-appear between the retracted collagen fibers. Simultaneously, the basal membrane of the seminiferous tubulus thickens; maturation of this membrane is previously observed during the prepubertal period of the young fox.

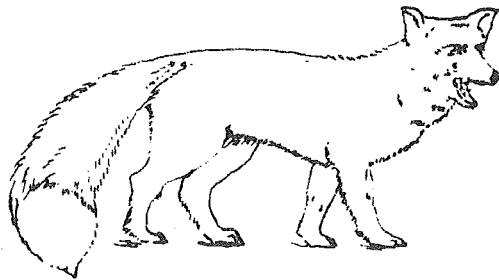
These results are discussed and related to testicular activity in young and adult foxes; the changes are related to pituitary activity. Capsular shrinkage in the adult fox during the regressive period is an active process causing spiralization of arteries and vein distortion. It appears that the testicular capsule and the septa must play a role in seasonal control of testicular hemodynamics in the adult fox.

Ann. Biol. anim. Bioch. Biophys. 1977, 17 (5A), 695-712.

1 table, 3 figs., 10 photos, 54 references.

(French with english summary).

Authors summary.



★ BLOOD CIRCULATION IN THE TESTIS OF THE ADULT WILD RED FOX (*VULPES VULPES*): INVOLVEMENT OF THE TESTICULAR CAPSULE AND SEPTA IN THE SEASONAL CHANGES OF TESTICULAR VASCULATURE AND CAPILLARY BLOOD FLOW.

(Circulation testiculaire chez le renard roux (*Vulpes vulpes* L.) adulte: Participation de la capsule testiculaire et des septa interlobulaires aux variations saisonnières de la vascularisation et du débit sanguin capillaire.)

Michel Joffre, Laboratoire de Physiologie comparée, Faculté des Sciences, Parc Grandmont, F 37200 Tours, France.

1^o In the adult wild red fox, spermatogenesis is plentiful from December to January (mating period); during this time, the testicular weight and the androgenic activity reach maximum values. Then, testicular weight decreases until May and remains in quiescence until September. During this resting period, the spermatogenic and the androgenic activities are low; only a few primary spermatocytes are present in the seminiferous tubules. From October to January, the testicular weight as well as the spermatogenic activity increase; one month later, the androgenic activity also increases (fig. 1A). During this seasonal reproductive cycle there are large variations in the testicular capillary blood flow (fig. 1B). In this study the following three points were observed:

A) These changes were closely related to the seasonal modifications of the exocrine and endocrine activities of the testis, except in August through September, when the testicular capillary blood flow increased before the stimulation of the gonad.

B) These changes were simultaneous with the modifications of the arterial network which supplies the testicular paranchyma. Indeed, during the breeding season, the course of the testicular artery and its main branches was completely straight (fig. 3). Then, at the beginning of the decreasing activity, spiralization of these arteries began to appear on the surface of the testis and, in June-July, all these arteries were heavily coiled (fig.3);

from October to January, all the spiral arteries were progressively disappearing. It was always noticed in September that although there was no change in the spiralization of testicular arteries, the testicular capillary blood flow increased.

C) These changes were not accompanied by any modification of the capillary bed, which always showed a straight course towards the intertubular spaces (fig.4).

2° Moreover, strong relationships between the vasculature of testicular parenchyma and the testicular capsule were observed at the periphery of the gonad or in the septa (fig.5). In addition, during the regressive period, the active retraction of the testicular capsule was observed and it showed a loss of both weight and total collagen content (fig. 1 C).

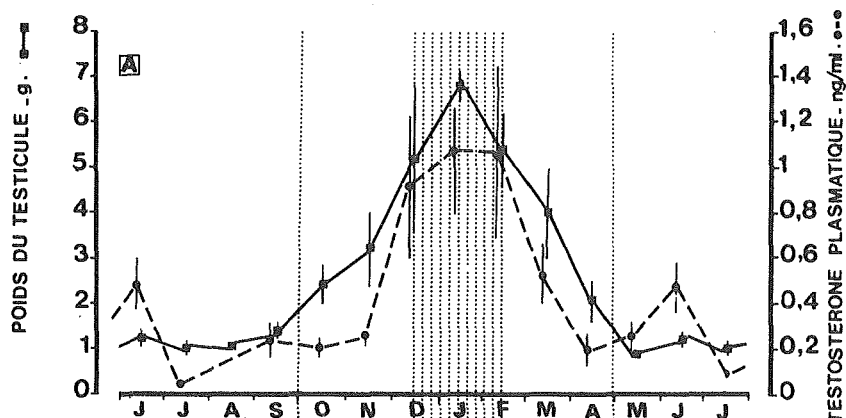
3° All of these results suggest:

A) The reactivity of blood vessels (appearance and disappearance of spiral arteries) during the regressive period of testicular activity was specific to the vascular network of fox testis. Indeed, in the rat, which showed a different organization of the testis (without septa and strong relationships with capsule), hypophysectomy or cryptorchidism involved no modification of the testicular vasculature.

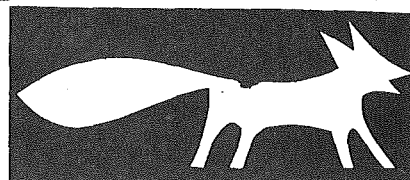
B) The capsule and septa were responsible for the cyclical changes of testicular vessels. Indeed, the active shrinking of these connective tissue structures obligatorily involved these modifications.

c) These modifications were responsible for the changes of testicular capillary blood flow throughout the seasonal cycle and, more particularly, for the decrease of capillary blood flow during the regressive period of low testicular metabolism. Indeed, the spiralization of the arteries, which decreased the blood pressure at the capillary level, as well as the retraction of the capsule, which increased the tissue pressure, induced a progressive decrease of the testicular capillary blood flow.

MICHEL JOFFRE



J. Physiol, Paris, 1977, 73, 155-176.
 1 table, 1 fig. 14 photos, 46 references.
 (French with english summary).



Authors abstract.

★ RELATIONSHIP BETWEEN TESTICULAR BLOOD FLOW: TESTOSTERONE SECRETION AND SPERMATOGENIC ACTIVITY IN YOUNG AND ADULT WILD RED FOXES (VULPES VULPES).

M. Joffre, Laboratoire de Physiologie Comparée, Faculté des Sciences, Parc Grandmont, 37200-Tours and Centre d'Etudes Biologiques des Animaux Sauvages, 79360-Beauvoir-sur-Niort, France.

Testicular capillary blood flow (TCBF) was measured by the radioactive inert gas clearance technique throughout the reproductive life of young adult foxes and was related to the spermatogenic and androgenic activities of the testis. Mean (\pm S.E.K.) blood flow ($\text{ml min}^{-1} \text{g}^{-1}$) was maximal in January in adults during the mating period (0.65 ± 0.03), and in pubertal animals (0.62 ± 0.04). At this time spermatozoa were observed in the testes of all animals, but testicular weight and circulating testosterone levels were lower in the pubescent foxes than in the adults. TCBF was minimal during immaturity (0.25 ± 0.03) and during the resting period of the adult (0.12 ± 0.01). These values were associated with a low testosterone level and with the multiplication of

gonocytes in the young or with the seasonal very low spermatogenic activity in the adult. During the prepubertal period, TCBF slowly increased and was accompanied by testicular growth. In the adult, in September, TCBF rapidly increased without changes of testicular size and then slowly increased as the testes enlarged. High plasma testosterone concentrations occurred later. During the period of testicular regression, TCBF, testicular size, spermatogenic and androgenic activities decreased together.

J. Reprod. Fert. 1977, 51, 35-40.
1 table, 1 figure, 34 reference.
(english).

Authors summary



★ THE USE OF SERUM GONADOTROPINS TO PROVOKE HEAT IN ANAPHRODISIAC FEMALE MINKS (*LUTREOLA VISON*).

(Použití sérových gonadotropinu k provokaci řije u anafrodisijních samic norku (*Lutreola vison*)).

J. Konrád, J. Mouka, J. Hanák, University School of Vet. Med.,
Ref. Centre for Carnivorous and Furskin Animals of the
State Vet. Administration, Trust Kara - Dept. for the
Development of Furskin Animal Breeding, Brno, Czechoslovakia.

Lyophilized PMGS in the doses of 50, 100 and 200 i.u. and raw PSM in the dose of 2 ml. were used to stimulate the sexual function in anaphrodisiac female mink (150 animals of the Standard and Hedlund breeds). The results of the trial indicated that the best provoking effect was achieved from the application of 100 i.u. PMGS. Taking into account the number of pregnant females and the number of the young born, the best results were obtained from the dose of 200 i.u. PMGS. In this case the numbers of young were 4.7 ± 2.2 per post-parturition female and 2.38 per female included in the trial. 246 young animals were obtained from 150 females treated with the hormones.

Veterinární Medicina, 17, 1972, č.8, 487-494.

3 tables, 2 figs, 7 references.

(Czechoslovakian with summary in russian, english, german and french).

Authors abstract.

★ THE INFLUENCE OF VARIOUS MATING SYSTEMS UPON FERTILITY OF FEMALE MINKS.

(Wpływ różnych systemów krycia na płodność norek.)

Janusz Maciejowski, Akademia Rolnicza w Lublinie, Instytut Biol. Podstaw Produkcji, Zwierzecej, ul. Akademicka 13, Poland.

Jerzy Sławoń, Stefan Brzozowski.

The effect of various mating systems upon certain indicators of fertility (percentage of pregnant females and the litter sizes) was evaluated on the basis of the results of two breeding seasons of Standard, Jet Black and Pastel female minks. The mating systems applied were classified as follows, according to the number of matings and time intervals between matings:

- I - single mating,
- II - 2-fold mating over one sexual heat,
- III - 2-fold mating; once in on sexual heat, once in the following one,
- IV - 3-fold mating; twice in one sexual heat, once in the following one,
- V - 3-fold mating, once in one sexual heat, twice in the following one,
- VI - 4-fold mating; various combinations.

Significant differences in percentage of fertile minks were found between females mated once (system I) and those mated according to all the remaining systems, in favour of the latter. Similarly, significant differences between VI (highest percentage of fertility) and alle the remaining systems were stated. There were shown no significant effects of mating systems upon the litter sizes. However, taking into account the mean litter size per one mated female, the best results appeared in minks of system III.

The results obtained lead to the conclusion that, more than twice mating of female minks is unreasonable. Acceptance of

the 2-fold mating system enables the number of males to be significantly reduced and, on the other hand improves the breeding results making it possible to obtain kits with a certain percentage.

Materialy Zootechniczne 4, 1973, 55-68.

5 tables, 13 references.

(Polich with english subtitles and summary).

Authors summary.

★ INVESTIGATIONS INTO THE INFLUENCE OF BODY WEIGHT ON
THE FERTILITY OF THE MINKS.

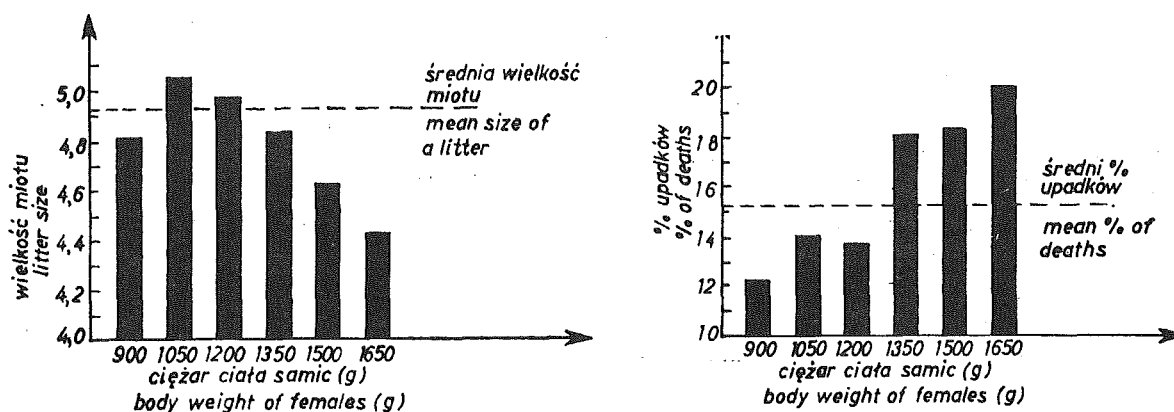
(Badania nad wpływem ciężaru ciała na plenność nerek.)

Janusz Maciejowski, Grażyna Jeżewska, Akademia Rolnicza w Lublinie,
Instytut Biol. Podstaw Produkcji Zwierzecej, ul. Akademicka
13, Poland.

Over a period of 4 years in a pedigree flock of Standard minks an investigation was undertaken of the relationship between the body weight of females and the size of their litters as also the vitality of those litters in the suckling period. In the flock investigated, neither of the traits indicated had yet been subjected to individual selection.

It was ascertained that, the most numerous litters are obtained out of females of a medium body weight. It is a fact that, the correlation between the litter size and body weight did not differ statistically from zero, but this was caused by non-linear relationship between those traits. The investigations into the mortality of young in the suckling period showed that, it was the lowest in the classes of females at lowest body weight and increased gradually, reaching a maximum in the class of the heaviest females. The unfavourable relation between the body weight and the reproduction traits is attributed by the authors to disturbance of the genetic balance in the population caused

by intensive selection for body weight conducted on minks for many years.



Materialy Zootechniczne 10, 1976, 17-27.

2 figs. 5 tables, 18 references.

(Polish with english subtitles and summary).

Authors summary.

★ DIURNAL ACTIVITIES OF MINK FEMALES DURING PREGNANCY,
AT LITTER TIME, AND SUCKLING PERIOD.

(Projevy denní aktivity norčich samic v období
březosti, porodu a kojení mládat.)

František Kukla, Karel Kostroň, ústav chevu kožešinových zvířat,
Vyseká škola zemědělská, Zemědělska - 1, 600 00 Brno,
Czechoslovakia.

The object was to study diurnal activities of mink females on a group of 13 animals kept under normal ranch conditions. Involved were high-pregnant females, those immediately after giving birth to their young, with their young aged from 13 to 23 days, and with no Young (barren), each observed separately.

The results allow to draw the following conclusions:

1. Of the factors provoking the diurnal activities of minks the observed animals maintained, under pen conditions, only responses to the stimuli of hunger and thirst, further to the necessity of defecation connected, if need be, additionally with a special, characteristic function, that of odour.
2. The seasonal physiological conditions of mink females did not exert any influence of moment on their diurnal activities;; the most relevant consequence being the shorter time spent outside the nestbox during the early developmental stage of the young, as these are not endowed with the ability of regulating their bodily temperature (thermoregulation) at that time.
3. Since the pen conditions do not offer the animals any chance of using their hunting instinct, those with the so-called "nervous character" may be provoked to a persistent, stereotypic running about.
4. Because of its short digestive tube and the fast digestion, the mink takes only small amounts of food at a time but at frequent occasions, during the night and the day time as well.
5. Under natural, frequently no easy conditions for preying this physiological property accounts for mink's unceasing aggressive nature which is also retained in the pen.

Acta Universitatis Agriculturae, XVI, 688, 3, 1968, 519-527.

1 table, 4 figs, 21 references.

(Czechoslovakian with summary in english, russian and germany).

Authors abstract.

★ RESULTS OF AN INFORMATIVE MINK TESTICLE TESTING
DURING THE PRE-MATING SEASON.

(Orientační šetření obnovy činnosti samčích gonád
norků v době přioravy říje).

Karel Kostroň, František Kukla, Inst. of Fur Bearing Animals,
Dept. for Breeding Horses, Sheep, and Fur Bearing Animals,
University of Agriculture, Brno, Czechoslovakia.

The seasonal regeneration of testicles is very important in mink breeding. Grading of the whole breeding stock on the farm must be done by the rancher during November. The judgements must be made not only from the view of perfect beauty of the fur, but rather from the standpoint of fertility. The difficulty remains only in that the mating season comes three months later than the pelting time, which may result in disappointments.

The morphological organisation and the physiology of reproduction in mink have recently been the object of studies by Enders (1941), Pearson et Enders (1944), Asdell (1946), Belyayev et Fedosov (1959), Shackelford et Hartsough (1960), Abramov (1951), Ilyina (1963), Johansson (1966), Hansson (1947, Venge (1965), Kostroň (1954, Kuznetsoff et Sharay (1962). Onstad (1967) has informed most recently about the growth of testes during the year, and Lundh (1961) in particular. Some supplemental notes have been reported by Kellog et Bassett (1946), Travis et Scheible (1967) and Gunn (?).

The results of our research in testicle testing during the pre-mating season have made it possible to draw the following conclusions:

1. The testicles of mink males at the pelting time (November to December) are wholly inactive. The method of microscopical testing the males by elektroejaculation is useless.
2. Such measurements would bring satisfactory results in the second half of February when, however, it is too late from the point of view of pelting time.
3. It follows therefore that for the breeding season a surplus of breeders should be maintained for the breeding season and these should be tested immediately after copulation by vaginal smear examination.

Acta Universitatis Agriculturae, XVII, 738, 1, 1969, 201-205.

4 tables, 6 photos, 19 references.

(English with czechoslovakian summary).

Authors introduction and
summary.

★ THE SEASONAL CHANGES OF THE MINK'S TESTICLE VOLUME.

(Sezónni změny varlat norkú během roku).

Karel Kostroň, František Kukla, Inst. for Fur Breeding, Dept. of Horse, Sheep and Fur Breeding, Zemědělská 1, Brno, CSSR.

Minks are animals of a seasonally determined matting time. To this determination of matting time is related an atrophy and regeneration of testicles. The practical consequences of these events are very significant for breeding purposes.

Records about the seasonal testicle development are already known. Stieve (1923) wrote about the seasonal changes of testicles in mice and sparrows. Van Oordt and Van der Heyde (1928) suggested the influence of environmental temperature upon the spermiogenesis. Some records about the testicle volume or weights could be found in Abramov (1951, 1960) Asdell (1946), Beljajev and Fedosov (1959), Borozdin and Mičurina (1964) noted the influence of light upon the mink males. Further data about the testicles of mink comes from Enders (1941), Hanson (1947) and also Iljina (1963). Some more information may be found in works of Johnsson (1966), Kellog and Bassett (1946), Kostroň (1962), Kostroň and F. Kukla (1969, 1970). General data related to this subject matter are also gathered by Lisiecki (1960), Kuzněcov and Saraj (1962, Lundh (1961, Onstad (1967), Pearson and Enders (1944), Shackelford and Hartsough (1960), Tiba, Ishikawa and Murakami (1968), Travis and Scheible (1967). Finally, the reader is referred to the works of Szuman, Wolinski and Kulikowski (1955), Venge (1950, 1958), Hartung (1971) Frindt a j.

The investigation of seasonal changes of testicles in mink which was performed during a year ascertain:

1. The results verify the findings of the Onstad's study concerning the weight of testicles and the work of Lundh about the average breadth of testicles.

2. This study has completed the measurement of seasonal changes in mink's testicles by investigation of new added parameters: the volume, the length and height. These parameters including weight were followed under the conditions of Central Europe (Czechoslovakia) during a full one years.

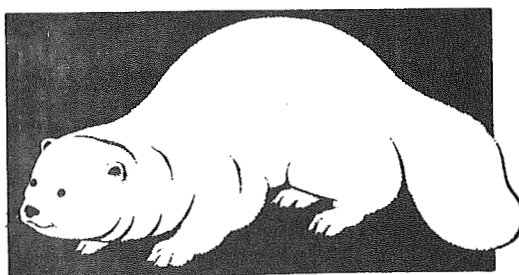
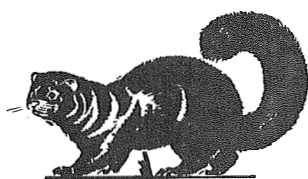
The result of this study prove the generally known seasonal changes of mink's testicles as being in both respects: (1) all significant morphological parameters as well as (2) histological pattern of tissues.

Acta Univ. agri., fac., agron. XIX, 1971, 1, 172-178.

6 tables, 4 figs., 32 references.

(English with summaries in czechoslovakian, russian and german).

Abstract G. Joergensen.



$$HH \times hh = Hh$$

★ INVESTIGATIONS CONCERNING SELECTION FOR FUR CRITERIA
IN MINKS.

(Untersuchungen über die Selektionswürdigkeit von
Fellmerkmalen beim Nerz.)

G. Benthin, Institut für Tierzucht und Tierhaltung der Universität
Kiel, Olshausenstrasse 40-60, 2300 Kiel, Germany.

Investigations concerning selection for fur criteria in minks
have been conducted on a farm in Schleswig-Holstein. Population
parameters for fur criteria have been assessed. Correlations
between fur quality graded by visual appraisal and the returns
as well as between the gradings of scraped furs and the returns
have been calculated.

Summarizing all the individual results leads to the conclusion
that the available data was insufficient and unbalanced.

Nevertheless some important facts have been learned, at there
are:

1. The criteria used on auction sales - fur size, -quality,
and -colour - determine the differences in returns by about 2/3.
2. The grading criteria according to the rules of the German Mink
Breeders' Association do not effect the returns.
3. Among the grading criteria it is "colour of the undercoat and
the kemp" which may be used as an auxiliary trait according to
the estimated population parameters.
4. It is not inconceivable that by preparing the fur genetical
differences in fur quality may be masked.
5. Obviously the grades for the size are too approximate for an
understanding of all the existing genetical differences.

Since especially the population parameters in this study have been
estimated unsatisfactorily, further investigations concerning

selection for fur criteria in minks are wanted.

Züchtungskunde, 49 (5), 394-400, 1977.

6 tables.

(German with english subtitles and summary in english, french and russian).

Authors abstract.

★ HERITABILITY ESTIMATES FOR SIZE AND PELT CHARACTERISTICS OF DARK MINK.

(Arvbarhetsestimater for størrelse og pelsegenskaber hos mørk mink).

Jostein Reiten, Norges Landbrukshøgskole, Dept. of Poultry and Fur Anim. Sci., 1432 Ås-NLH, Norway.

The objective of the present investigation was to find heritability estimates for a series of traits of summer fur and winter fur of dark mink and compare them with similar estimates in the literature. The material includes practically all dark mink kits produced at the Agricultural University of Norway during the years 1972-1975, totally about 5000 animals corresponding to ca. 3700 skins. Average numbers of kits per mother (litter size) have been 4-5 kits corresponding to 3-4 skins. In each half sub group there have been on the average 12-16 kits or 10-14 skins.

The heritability estimates based on the variance component of dams (h^2_d) have generally been higher than the corresponding estimates calculated by means of the variance component of sires (h^2_s). This is assumed to be connected with large maternal effect (litter effect) for these traits.

For some characteristics, like for example hair length, metallic, and crinkled guard hairs, there have been found higher heritability estimates by skin grading than by judging the same traits of

live animals. This is probably caused by greater difficulties in judging these characteristics of live animals than of skins. The heritability estimates for traits judged on summer fur are of the same size as for corresponding traits judged on winter fur.

For traits where similar heritability estimates have been found in the literature, these have been compared.

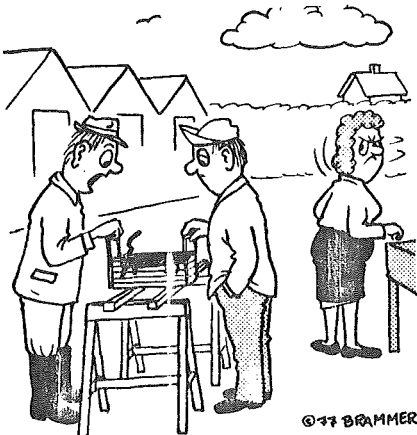
From this discussion following heritability estimated (h^2 s) can be outlined:

Body weight, body length, skin length, skin weight	0.3-0.5
Colour shade	0.2-0.4
Length of guard hairs	0.5-0.7
Length of underfur	0.3-0.6
Density of fur (guard hairs and underfur)	0.1-0.3
Hair elasticity, hair quality, general pelt quality	0.2-0.4
Metallic	0.3-0.6
Singe	0.2-0.4
Wet belly	0.1-0.2
Leather thickness	0.2-0.3 .

Meldinger fra Norges Landbrukshøgskole, Vol. 56, 1977, no.16.
2 tables, 8 references.

(In norwegian with english summary and subtitles).

Authors abstract.



After my opinion she is to fat,
the quality thin and the colour
extremely poor.

★ KIDNEY CONCREMENTS IN MINK AFTER FEEDING FISH ENSILAGE.

A. Helgebostad, R. Svenkerud, The Research station for Fur-bearing Animals, Veterinary College of Norway, Box 8146, Oslo 1, Norway.

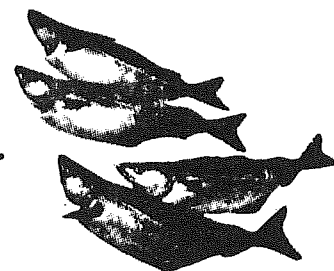
Feeding experiments have been carried out with standard mink on a diet where 50 percent of the protein came from fish ensilage. AIV acid (H_2SO_4 , HCl) or NaOH was used for preserving. Before feeding the ensilages were neutralized with $CaCO_3$ in the AIV group and AIV acid in the basic group.

The high percentage of fishensilage in the feed had a negative influence on the appetite. The pups did not grow very well.

During the experimental period from weaning to pelting time the animals got kidney damages (nephrose), and small kidney concrements were seen in both groups. Analyses of the concrements showed that they were containing triplephosphate ($MgNH_4PO_4 \cdot 6H_2O$).

Norsk Veterinærtidsskrift 1977, 89, 653-656.
(Norwegian with english summary).

Authors abstract.



★ THE FORMALDEHYDE CONTENT IN FISH IN RELATION TO ANEMIA IN MINK.

A. Helgebostad, I.W. Dishington, The Research station for Fur-bearing Animals, Veterinary College of Norway, Box 8146, Oslo 1, Norway.

The fish-induced anemia in mink is an alimentary disease produced by feeding high amounts of some raw marine fishes. The anemiogenic properties of the fish has been related mainly to its content of the iron binding agent-trimethylaminoxide.

The aim of the present investigation was to examine how far formaldehyde could also play a part as an anemiogenic factor.

The content of formaldehyde has been analysed in all species of raw, cold stored fish known to be used in mink food in Norway and in a few samples of ready made food (Table II). The content of formaldehyde varied within wide limits from 12 to 105 ppm, but none of the measured contents reached the high values obtained by Costly (1970). The mean values of formaldehyde in gutted coalfish, fillet waste of coal fish, cod and haddock prepared for the feeding experiments, were all close to 50 ppm.

175 female mink and 632 kits were tested during the whole of the breeding period from 15.2-30.6. 80 percent of the diet (page 1) was fish products with and without supplements of formaldehyde. Amounts from 200 to 50 ppm were tried.

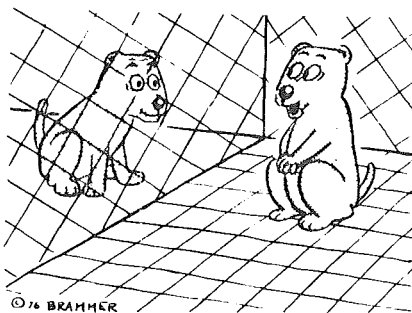
The supplement of 200 ppm formaldehyde had an appetite-decreasing and anemiogenic effect, but the supplement of 50 ppm, i.e. a formaldehyde content up to the highest value observed in fillet waste, had no effect on appetite or hemoglobin synthesis neither in females nor in kits. The content of formaldehyde did not counteract the anti-anemiogenic effect of iron glutamate.

The fish-induced anemia occurring in mink thus appears unaffected by the quantities of formaldehyde found in fish diets to fur bearing animals. Triox must be regarded as the dominant anemiogenic factor in raw fish diets.

Nord. Vet.-Med. 1968, 28, 108-114.

(English).

Authors abstract.



My Hb % was OK !

★ THE UTILIZATION OF HYDROLYZED NITROGEN WASTE IN THE NUTRITION OF FUR-BEARING ANIMALS.

(Využití hydrolyzovaných dusíkatých odpadů ve výživě kožešinových zvířat.)

F. Mikoška, M. Macková, K. Otevřelová, Animal Nutrition Research Institute 691 23 Pohořelice, Brno, Czechoslovakia.

All waste raw materials from tanneries are suitable for the production of hydrolyzates. Research proved the need for the hydrolytic processing of the material to raise the digestibility of nitrogenous substances. The hydrolytic process, as proposed, cuts the costs of the chemicals needed in production and the time of processing. The hydrolyzate can partly replace animal protein fed to minks in meaty half-dry or dry feed mixtures (up to 16% of the whole proportion of animal protein in the mixture). The administration of hydrolyzate in the period of the winter hair shedding significantly improves the skin quality and reduces the costs of feeds.

Živočišná Výroba, 22, 1977 (7), 539-546.

4 tables, 16 references.

(Czechoslovakian with english subtitles and abstracts in english, russian and german).

Authors abstract.

★ INFLUENCE OF FEEDING WITH FODDERS CONTAINING BY-PRODUCTS OF FEMALE REPRODUCTIVE ORGANS; FISH MEAT AND VARIOUS KINDS OF FAT ON FERTILITY AND FECUNDITY OF MINK.

(Wpływ żywienia dawkami podkarmowymi z udziałem macic bydlecych i wierprzowych oraz pasz rybnych i tłyszczu.)

Stanislaw Jarosz, Jan Barteczko, Instytut Żywienia Zwierząt i Gospodarki Paszowej, AR Kraków, Poland.

The respective experiment was carried out on 480 minks of standard variety, divided into 6 groups. The fodder rations of particular groups contained 50% of the experimental fodder and were as follows: group I - by-products (uteri of cattle and pigs), group II - control for the group I (lungs and udders), group III - fatty fish meat (mackerel), group IV - lean fish meat (cod), group V - lean fish meat + 6% fresh fat, group VI - lean fish meat + rancid fat. In the subgroups III a, IV a, Va and VIa the period of feeding with the experimental fodders was from January 1 to June 30, 1974, while in the subgroups IIIb, IVb, Vb and VIb - from July 1, 1973 to June 30, 1974.

During mating the highest motile spermatozoa level was found in the male semen in the sub groups IVb (54%), Va (53%), I (50%) and IVa (44%). In the remaining groups (subgroups) the number of motile spermatozoa varied between 30-38%. Likewise, the number of successful matings and number of kits per 1 male was the highest in the subgroups IVa, Va and IVb, amounting to 3.6 and 20.6, 3.1 and 19.7, 3.0 and 16.0, respectively.

The fertility percent in females in the groups I, II, IIIa, IIIb, IVa, IVb, Va, Vb, VIa and VIb was 58.7, 63.7, 63.3, 68.8, 82.8, 85.0, 78.3, 69.6, 68.0%, respectively, while that of fecundity (number of kits per 1 female in relation to all females) was 2.02, 2.35, 2.40, 1.71, 3.45, 3.75, 3.87, 4.00, 2.48 and 1.16%.

Zeszyty Problemowe Postepow Nauk Rolniczych, 1976, z.180, 491-498. 3 tables, 11 references.

(Polish with summaries in english and russian).

Authors abstract.





★ FAT CELL NECROSIS IN THE FATTY LIVER SYNDROM IN MINK.

G.M. Dorrestein and L.H.J.C. Danse, Department of Veterinary Pathology,
University of Utrecht, Biltstraat 172, Utrecht, The Netherlands.

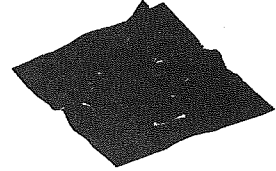
Studying the influence of the protein-fat ratio of the diet on the weight gain during the last months before pelting, we found a high incidence of animals having both an enlarged fatty liver and kidney and macroscopical changes in adipose tissue. The changes in adipose tissue consisted of little white, dull spots scattering in all fat depots. The microscopical study of adipose tissue proved a hundred percent incidence of fat cell degeneration in animals with fatty liver. Parrafin sections of adipose tissue showed the typical characteristics of degenerated fat cells with a vacuole filled with eosinophillic, green-autofluorescent degraded fat. Degenerated fat cells were often surrounded with foamy macrophages.

This histological picture is quite similar to yellow fat disease. However, lipofuscine in fat cells and macrophages, which phenomenon is very characteristic in yellow fat disease, was absent in this disorder. Moreover yellow fat disease starts with lipofuscin-laden macrophages in adipose tissue without fat cells damage, while in this disorder degenerated fat cells were seen from the beginning.

Based on this histopathological differences this disorder could be distinguished from yellow fat disease. Moreover the food composition was in such a manner that a vitamine-E deficiency could not be expected. However, since the affected animals always occurred in the same dietary group, a relation with some nutritional factor seemed probable. When this suspected diet was used for a second time, a new outbreak of the disorder occurred within four days. Nevertheless a third trial with mink, guinea pigs and rats was negative.

Blood analysis of affected and healthy mink proved a serious liver injury in animals with an enlarged fatty liver. However blood values of healthy mink on the suspected diet were not different from those of healthy mink in other dietary groups.

4 Tables, 5 Figures and 5 References.



Der Praktische Tierarzt, 1978 (in press).

Presented as an abstract on the 3th meeting about furbearer-, rabbit- and pet rodent diseases, in Celle, Germany, June 1977.

★ SEROLOGICAL INVESTIGATIONS IN THE DIAGNOSTICS OF
TUBERCULOSIS OF MINKS.

(Badania serologiczne w diagnostyce gruźlicy norek).

Jadwiga Ocetkiewicz, Jan W. Stefan, Henryk Wojtacha,
Zakład Hodowli Drobrego Inwentarza Instytutu Zootechniki,
Kraków, Poland.

In the years 1968-1972 autopsy investigations of minks of two varieties - Standard and Finnish Topaz - were carried out in the Experimental Station of Animal Husbandry Chorzelów. The autopsy material was sent to the Tuberculosis Immunology Laboratory of the Veterinary Institute in Pulawy and there a strain of tuberculosis marked F 127 was isolated. This strain showed the characteristics of *Mycobacterium avium*. The poultry farm supplying the mink farm with eggs is free from tuberculosis, so only wild fowl, abundant in the district where the farm of meat-eating animals is situated can be the source of infection.

The Pulawy Bioveterinary Industry works prepared an antigene from the strain of Mycobacterium avium for experimental purposes. 340 tests of agglutination with the freshly taken drop of mink blood were made. 54.7% had positive results. The total conformability of the observed agglutination both positive and negative reactions, with the results of the anatomo-pathological autopsy came to 76.2%. The authors suggest the carrying out of a greater number of serological samplings of mink blood with the antigene tbc "Tuberculoagnost" subsequently controlled by autopsy of minks slaughtered for the obtainment of skin.

As a result of the investigations that were carried out and the results that were obtained it was found out that the minks were infected with bird's bacillus, to which little attention has been paid up to now; the infection by mammalian bacillus as typical for the species was stressed.

Rocz. nauk. Zoot. (The Polish Journal of Animal Science and Technology), 1, 1974, 53-57.

16 references.

(Polish with abstracts in english and russian).

Authors abstract.

★ AN ATTENUATED MINK ENTERITIS VIRUS AND ITS USE IN A TRIVALENT VACCINE: STUDIES ON SAFETY AND ANTIGENICITY.

I. Vacek, K.F. Lawson, W.A.M. Gregg, Connaught Laboratories Ltd., 1755 Steeles Avenue West, Willowdale, Ontario, Canada.

Mink Enteritis is a highly contagious disease of mink caused by a parvovirus which is closely related, antigenically, to the virus which causes feline panleucopenia.

An attenuated live virus mink enteritis vaccine was developed by serial propagation of a virulent virus in feline kidney tissue cultures. Safety of the vaccine virus was demonstrated after 67 passages. It was shown that the vaccine virus was stable and

did not revert to virulence even after six serial back-passages in mink. Although the virus can be isolated from tissues and feces of mink for several days following vaccination, the virus did not spread from vaccinated to nonvaccinated animals kept in close contact over a three month period. The vaccine showed a good immunogenic response in mink when used either alone or in combination with mink distemper vaccine and Clostridium botulinum toxiod, type C, beta.

Can. Vet. Journ. vol. 18, no.11, November 1977, 301-308.

12 tables, 10 references.

(English with summary in french).

Authors summary.

★ PATHOLOGIC ANALYSIS OF MINK MORTALITY IN NEW ENGLAND
MINK.

Marvin A. Friedman, Francis D. Griffith, Shirley Woods,
Dept. of Pharmacology, Med. Col. of Virginia, Health Sci.Div.,
Virginia Commonwealth University, Richmond, Virginia 23298,
USA.

The underlying cause of death of a group of New England mink, which died in 1969 to 1970 was explored. PCB and chlorinated hydrocarbon pesticide levels were measured. Aroclor 1254 levels in these mink were elevated 73 fold over levels in healthy mink in 1974. DDT levels were elevated 5 times and DDE 3 times over those control animals. Gross pathology revealed lesions of the lungs, liver and kidneys. These lesions were confirmed microscopically. The lungs of the New England mink showed inflammation and congestion. Areas of inflammation were also present in the liver. Massive areas of necrosis were seen in the kidneys, both in the medullary and cortical areas. Kidney involvement was greater than any other organ. P.A.S. positive material was seen in each of these organs with the kidneys showing largest amounts of this material. Since the New England mink did not show

lesions of the G.I. tract, did not exhibit fatty degeneration of the liver, which PCB toxicity is known to induce in mink and because they showed areas of congestion, inflammation and positive P.A.S. material, PCB's were not considered the toxic agent. However, fungus or bacterial infection might be the causative agent.

Archives of Environmental Contamination and Toxicology,
Vol. 5, 457-469, 1977.
3 tables, 13 photos, 12 references.
(English).

Authors abstract.

★ DETECTION OF INAPPARENT ALEUTIAN DISEASE VIRUS INFECTION
IN MINK.

S.H. An, D.G. Ingram, Dept. of Vet. Microbiology and Immunology,
University of Guelph, Guelph, Ontario N1G 2W1, Canada.

An inapparent or nonprogressive form of Aleutian disease virus infection is described which occurred in about 35 to 40 percent of naturally infected pastel mink on commercial ranches. Mink with this inapparent infection appear to be healthy but react positively on the counter-electrophoresis (CE) test. This inapparent infection persists in the mink for many months and the antibody activity is maintained at a stable but relatively low titer (less than 256). The gammaglobulin levels in these mink may be marginally elevated but remain within normal limits. Neither gross nor histopathological changes were present in the tissues of mink with inapparent infection but the virus persisted in the blood, mesenteric lymph nodes, kidney, liver and spleen.

The Amer. J. of Vet. Research, Vol. 38, 10, 1977, 1619-1624.
7 tables, 4 figs., 16 references.
(English).

Authors abstract.

★ SUSCEPTIBILITY OF FOXES TO CLOSTRIDIUM BOTULINUM
TYPE C AND E TOXINS.

M. Yndestad, A. Helgebostad, G. Loftsgård, The Research station
of Fur-bearing Animals, Veterinary College of Norway,
Box 8146, Oslo 1, Norway.

Investigations were performed to determine the exact susceptibility
of foxes to Clostridium botulism type C and E toxins.

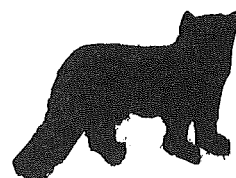
Doses of 5 mill. MLD type C toxin mixed with the feed did not
cause symptoms of botulism in either cubs or adult foxes.
Subcutaneous injections of ^{x)}300.000 MLD or more were fatal to
cubs, while 750.000 MLD caused the death of all adults.

Regarding type E toxin, doses of 1 mill. MLD affected neither
cubs nor adults on oral administration. Subcutaneously injected
doses of 5.000 MLD or more killed all cubs, while 10.000 MLD
was required to produce lethal effect on adult animals.

The conclusion made is that foxes are highly resistant to both
type C and E Clostridium botulinum toxins following oral applica-
tion. It is further revealed that foxes are 60-70 times more
susceptible to type E than type C toxin when injected subcutaneous-
ly.

x) MLD - Mouse lethal doses.

(English)



Authors abstract.

★ THE POSSIBILITIES OF COMBINES VACCINATION OF MINKS
AGAINST AUJESZKY'S DISEASE, RABIES AND BOTULISM.

(Možnosti sdružené vakcinace norku proti Aujeszkeho
chorobé, psince a botulismu.).

J. Konrád, J. Mouka, R. Dvořák, J. Hanák, University School of
Veterinary Medicine, Palackého 1-3, Brno, Czechoslovakia.

A trial was undertaken in 60 minks to determine the clinical tolerance and the effectivity of the combined vaccination against Aujeszky's disease, rabies and botulism. The following preparations were used: commercially-produced live avirulent lyophilized vaccine against Aujeszky's disease, live avirulent lyophilized vaccine against rabies, and antoxin Cl. botulinum type C bonded to the gel of aluminium hydroxide. The immunity response of the animals was evaluated separately for the minks vaccinated simultaneously and by the combined method. The purpose of the trial was to develop a new method of the vaccination against all the three infectious diseases at the same time. The suggested protective vaccination is based on the possibility of using a single inoculation of the lyophilized vaccines against Aujeszky's disease and rabies rehydrated in the vaccine against botulism applied to young animals at the age from 10 to 12 weeks, and revaccination against Aujeszky's disease and botulism after 4 to 6 weeks.

Veterinární Medicína, 17 (XLV) 1972, 9, 539-544.

1 table, 11 references.

(Czechoslovakian with abstracts in russian, english and german).

Authors abstract.

★ THE CLINICAL AND ETIOLOGICAL ASPECTS OF UROLITHIASIS
IN MINKS (LUTREOLA VISON).

(Klinika a etiologické aspekty urolitiázy norku
(Lutreola vison)).

J. Konrád, J. Hanák, J. Mouka, University School of Vet. Med.,
Palackého 1-3, 612 42 Brno, Czechoslovakia.

Along with the present findings in the field of urolithiasis etiology and pathogenesis the paper presents characteristics of the occurrence of this disease in Czechoslovakia in the period from 1965 to 1970. The possibilities of therapy and prophylaxis from the susceptibility and causal viewpoints are demonstrated

on the case of a mass occurrence of mink urolithiasis on a farm. As to non-infectious diseases of minks, urolithiasis shares 7.2% of all mortality, and other lesions of the urinary tract and another 3.9% of losses for non-infection causes. Under Czechoslovak conditions, urolithiasis is of seasonal character with culmination in April, May and September. The clinical course and pathological and anatomic changes in gravid females are described on the actual example of the farm affected by the mass occurrence of urolithiasis in the spring months. There is an economic evaluation of the loss of the animals and the loss of 474 fetuses from the females. Chemical analysis identified the stones as magnesium-ammonium phosphate (struvit). Germs of the genera *Proteus*, *E. coli*, *Streptococcus* and *Staphylococcus* were isolated bacteriologically as the microflora breaking down urea. The therapy check in the form of the farm diet acidification with an addition of 0.8 phosphoric acid in a 75% concentration or with ammonium chloride in the dose of 1 g per animal per day combined with antimicrobial treatment using Chloramphenicol syrup in the dose of 50 mg per animal per day gave successful results.

Veterinární Medicína, 18 (XLVI) 1973, 9, 533-540.

3 figs., 1 photo, 14 references.

(Czechoslovakian with summaries in russian, english and german).

Authors abstract.

★ THE CLINICAL EVALUATION OF SOME METHODS OF THE USE OF DRUGS FOR THE IMMOBILIZATION OF MINKS (*LUTREOLA VISON*).

(Klinické zhodnocení některých medikamentózních způsobu imobilizace norku (*Lutreola vison*)).

J. Konrád, J. Hanák, J. Mouka, University School of Vet. Med., Palackého 1-3, 612 42 Brno, Czechoslovakia.

Succinylcholiniodide Spofa is clinically evaluated as to its effectiveness for general relaxation, chloral hydrate, prepared magistraliter in a 10% glucose solution, Thiopental Spofa,

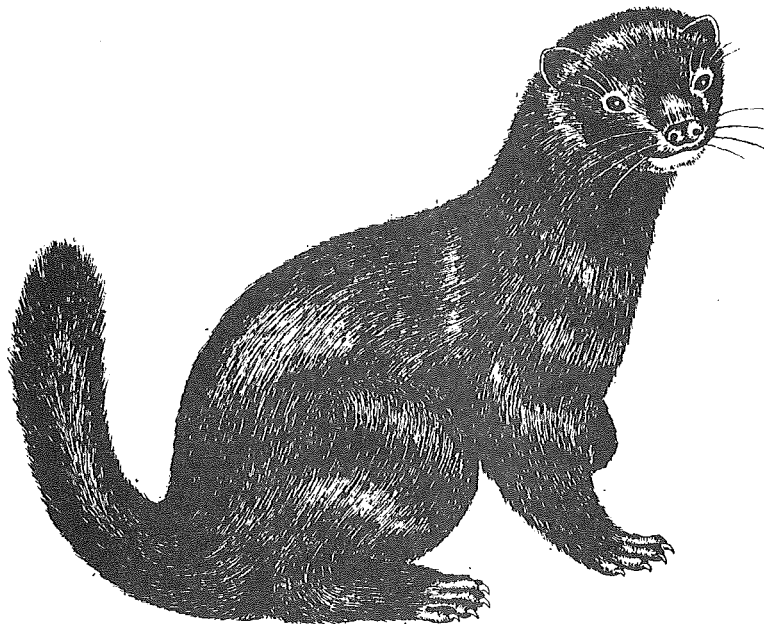
Phlegomasin (chlorpromasin), and Rompun (Bayer) are evaluated as to their effectiveness for the reduction of the aggressivity of minks. Succinil cholin iodide is not suitable for current use in practice. A chloralhydrate solution is suitable for the immobilization and narcotization of minks for long-term operations, the doses are 5.0-7.5 ml per animal, applied intraperitoneally. The intrapulmonary application of Thiopental at the dose of 30-40 mg per kg l.w. gives excellent results, this drug causes general anesthesia and narcotization within one minute, and the effect lasts 30-45 minutes. Phlegomasin applied in the doses of 15 mg per kg of live weight did not give the desired immobilization effect. Rompun was also found unsuitable for use in field practice due to relatively high excitations.

Veterinární Medicína, 19 (XLVII), 8, 511-516.

6 references.

(Czechoslovakian with summaries in russian, english and german).

Authors abstract.



★ COMMUNICATION.**CENTRALNA BIBLIOTEKA ROLNICZA**ЦЕНТРАЛЬНАЯ СЕЛЬСКОХОЗЯЙСТВЕННАЯ БИБЛИОТЕКА
CENTRAL AGRICULTURAL LIBRARYUL. KRAK. PRZEDMIEŚCIE 66
WARSZAWA 40

NR...CW.III-5/70/Dn/77

WARSZAWA.....8.XI.....1977

P.O. BOX 360
00-950 WARSZAWA, POLAND

Dear Mr. Joergensen,

We acknowledge with thanks receipt of your letter GJ/EA of October 24th as well as the enclosed journal SCIENTIFUR vol. I, 1977, nos. 1, 2, 3 and the introductory issue-nov. 1976

We are pleased to let you know that we will be sending you all original reports from Polish researchers in the field of fur bearing animals.

We would be very happy indeed to receive SCIENTIFUR on an exchange basis.

Thank you once more for your kind cooperation.

Yours sincerely,

Dyrektor
Centralnej Biblioteki Rolniczej
Rezerwowej Ośrodka Informacji
dr Jerzy Bański

COMMONWEALTH BUREAU OF ANIMAL HEALTH
Telephone: Byfleet 42826.
Central Veterinary Laboratory,
New Haw, Weybridge, Surrey, K15 3NB

Thank you for sending the first three issues of "Scientifur". This new journal will be mentioned in the 'Books received' and 'Book reviews' sections of The Veterinary Bulletin, as well as being listed in Index Veterinarius under the heading "fur-bearing animals". Individual articles will also be entered into our documentation system.

Ry Mack

R. Mack, Director

*..... PLEASE ... **HELP** us with names and addresses of institutions or persons whom you know or think would be interested to see this issue of SCIENTIFUR.

FILL out the scheme(s), **SEND** it to us - and we will send a free copy of SCIENTIFUR to the addresses mentioned on the schemes.

helphelphelphelphelphelphelphelphelphelphelphelphelphelphelp

Following persons or institutions will be interested to recieve a free copy of SCIENTIFUR:

* name or institution

.....
address

* name or institutions

.....
address

* name or institution

.....
address

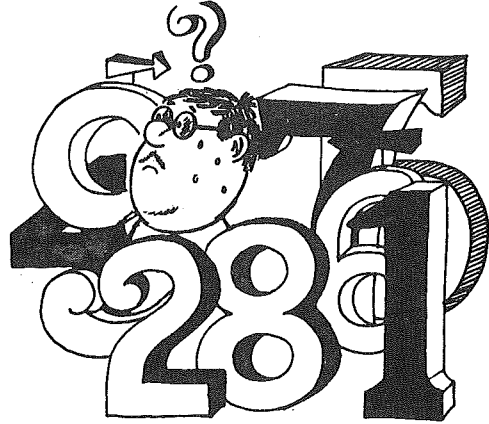
* name or institution

.....
address

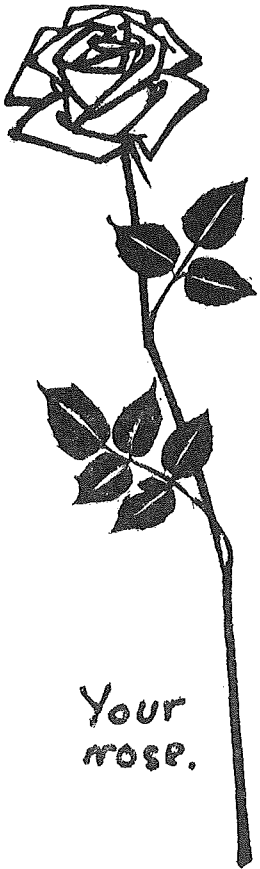
Dear friend.

Thank you so much for your help. If you know more names,
please write them here .

With kind regards



the editor.



*Your
rose.*

* We want to know all our friends, therefore , please Write
your name here :

SCIENTIFUR - Vol. 1, no. 4, page 27.

Below you can see a colour print of mink organs from the histamin experiment. As you may remember, there is room for them in SCIENTIFUR Vol. 1, no.4, page 27.

A extra job for you - but a saving of 15% of SCIENTIFURs total 1977-budget.

WE ARE VERY SORRY THAT THIS ISSUE OF SCIENTIFUR WAS THE LAST FOR YOU - UNTIL THE 1978 VOLUME IS PAID.

