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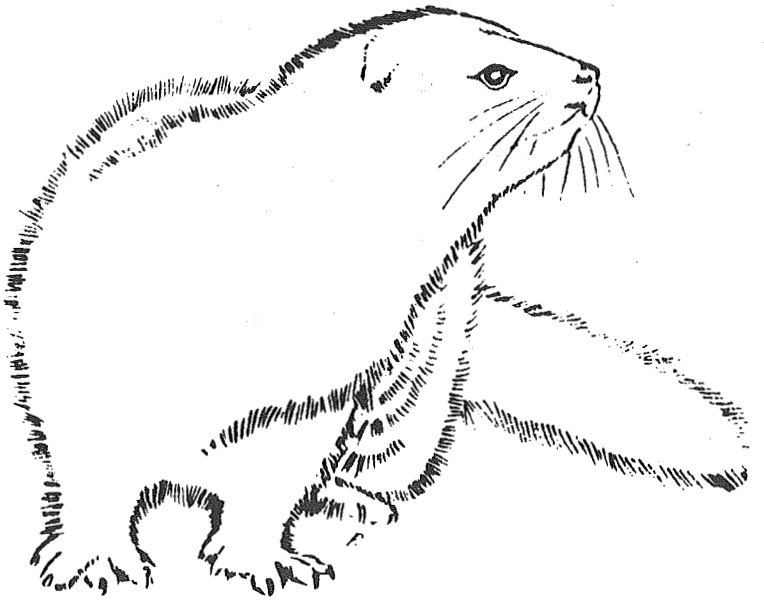

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SCIENTIFUR

Vol. 3, no.1, February 1979.

We in the editorial staff wish to thank for all the kind words we have recieved together with the payment for the 1979 subscription. You will find a copy of one of the letters under Communication, where the kind words was underlined with an economical donation to SCIENTIFUR. Thank you so much Arthur. We will do our best to give you and all the other of our readers an up to date scientific information about fur animal production.

But - dear readers - we are only able to bring the contributions if recieving them from you. Therefore, try to remember SCIENTIFUR both with original reports or - at least - with abstracts of all your scientific reports regarding fur animal production.

Concerning THE SECOND INTERNATIONAL SCIENTIFIC CONGRESS IN FUR ANIMAL PRODUCTION, which is planned to be held in Denmark April 1980, we have recieved a lot of positive manifestations from scientists, who wants to participate in the congress. You will find one of them under Communication. Now we know, that Canada, U.S.A., Great Britain, Nederland, France, Germany, Poland and all the Scandinavian countries will be represented at the congress, and it is at the moment our feeling, that the congress are going to be held. We will inform you further in the May issue of SCIENTIFUR. If you have special wishes for the congress program, please let us know as far as possible.

Some of you will find a red label in this issue of SCIENTIFUR. We hope, that this reminder will give rise to immediately payment of the invoice for the 1979 subscription.

Based on interest after reading the letter from Dr. W.M. Hails, Commonwealth Bureau of Animal Health, which was printed out under

Communication in SCIENTIFUR Vol. 2, no.3, pp 45-46, I have tried to make a literature search in the systems CAB-Abstracts and Agricola. In both the systems I have recieved more than 2ooo titles. It is of course a heavy work to systematize all these titles and compare them to the references from U.S.A. and Great Britain mentioned in earlier issues of SCIENTIFUR.

But at this moment it seems to be clear, that there is a lot of valuable unknown reports especially from USSR. It leads to the question, how far it on international basis can be realizable systematically to search for all the relevant literature and get valuable reports translated into English. We are discussing the problem in Scandinavia, and it should be appriciated very much, to recieve your suggestions about such a service and how to get it arranged and in addition,the interests. It is evident that the costs can be reduced by increasing the number of subscribers.

It is my hope, that all of you already have recieved my review over "The use of Soybean Products in Feeds for Fur Bearing Animals", and it is my hope that the report will give rise to, that the last problems will be solved based on more exact knowledge to the treatment of the soybean products and the treatments effect on the inhibitors in the meal.

For the next issue of SCIENTIFUR, we hope to recieve many reports from your 1978 research.

Kind regards

Your editor.

ANAL POUCH SECRETION IN MINK MUSTELA VISON.

Carita Brinck, Rune Gerell, Göran Odham, Lab. of Ecological Chemistry, Ecology Building, S-223 62 Lund, Sweden.

The anal pouch secretion from farm mink as well as free living mink was investigated on individual level. A sampling technique using polyethylen catheter allowing collection of secretion from living animals has been worked out. The chemical nature and mass spectra of the four main constituents are described. Two components have been identified as indole and 2,2-dimethylthiacyclobutane. An isomer of the latter has been identified as well as a cyclic disulphide, containing five carbon atoms. A possible structure is 1.2 dithiacycloheptane.

A large proportion of the secretion consists of a large number of chemically very similar compounds of high molecular weight which form a pattern specific for each individual. Comparative studies of the secretions of individuals reveal that this pattern contains individual information. The pattern of the individual appears stable during the whole year in adults, but differs somewhat with juveniles.

No specific sex differences could be found, not even during the reproductive period.

OIKOS, 3o, 68-75, 1978.
7 figs., 22 references.
English with summary in Russian.

Authors summary.

● DISTINGUISHING CHARACTERISTICS OF THE HAIRS OF EASTERN COYOTE, DOMESTIC DOG, RED FOX AND BOBCAT IN MAINE.

Henry Hilton, Norman P. Kutscha, Small Game & Furbearer Research Asst. Ldr., Box 644, Bingham, Maine o492o, USA.

Hairs from 32 coyotes (Canis latrans), 15 domestic dogs (Canis familiaris), eight red foxes (Vulpes vulpes) and five bobcats (lynx rufus) taken in Maine were examined to determine the essential distinguishing characteristics. Although several characteristics are strongly overlapping, hairs can often be distinguished by number, order and color of the bands, the cross-sectional translucence and shape, and the cuticular scale pattern.

The American Midland Naturalist, loo, 1, July 1978, 223-227.
1 table, 3 pictures, 17 references.

Authors abstract.

● DENTITION VARIATIONS IN THE COMMON POLECAT IN POLAND.

Andrzej L. Ruprecht, Polska Akademia Nauk, 17-23o Bialowieza, Polska.

Examination was made of the range of tooth pattern variations in a large number of skulls of Mustela putorius Linnaeus, 1758 from Poland (n=8o1). Additional upper incisors and upper incisors with fused crowns were found to occur more frequently in males (2,9%) than in females 1.8%), whereas the percentage of additional M^2 did not differ in individuals of the two sexes. The greater skull dimensions of common polecats from the Rzeszów population were accompanied by a more variable tooth pattern. Comparison of the number of teeth in polecats from Poland and Holland revealed

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a more strongly marked tendency to oligodonty in the latter (<o.ool).

Acta Theriologica, 23, 12, 239-245, 1978.
2 tables, 1 fig. 17 references.
English with summary in Polish.

Authors summary.

SKULL VARIABILITY OF MUSTELA PUTORIUS LINNAEUS, 1958.

Tadeusz Buchalczyk, Andrzej L. Ruprecht, Polska Akademia Nauk,
17-23o Bialowieza, Polska.

Examination was made of the degree of differentiation - both from the age and population aspect - of dimensions and proportions and also the correlation structures in 596 skulls of the common polecat, Mustela putorius Linnaeus, 1758, from Poland. Two local populations were distinguished - the Bialowieza and Rzeszow populations, which exhibit certain differences in respect of the relations examined in uniform sex and age groups. The skull of the common polecat is distinguished by very marked sex dimorphism of size, proportions, rate of growth and obliteration of sutures. the processes taking place in the polecat's skull are characterized by continuous changes lasting throughout the animal's life. Some skull dimensions of M. putorius, in particular zygomatic breadth (ZyB) and ectoorbital breadth (EctB), and also mandible weight (MdWt) are distinguished by continuous growth, unlike braincase capacity (BcC), which diminished with age. Commutability of periods of isometric and allometric growth was distinct in the correlation structures of the skull dimensions of males.

Acta Theriologica, 22, 5, 87-12o, 1977.
9 tables, 1o figs.,2 photos, 27 references.
English with summary in Polish.

Authors summary.

COMPARATIVE PREY CAPTURE AND FOOD STUDIES OF SOUTH AFRICAN MUSTELINES.

D.T. Rowe-Rowe, Natal Parks Board, Postbox 662, Pietermaritzburg, 32oo South Africa.

Food preferences, prey capture, feeding behaviour, and food requirements were studied in captive Ictonyx striatus and Poecilogate albinucha. Comparative information on diet was also obtained from the examination of stomach contents of animals collected in the wild. Both sets of data indicated that Ictonyx was polyphagous, eating almost all small animals, but mainly insects and rodents, whereas Poecilogate took only warm-blooded vertebrates. In prey capture tests Poecilogale emerged as a specialist killer of small mammals, while Ictonyx was more adaptable, being able to vary its killing pattern to deal with different types of prey.

Fig. 1. Ictonyx killing a rat.

Mammalia, 42, 2, 1978, 175-196.
6 tables, 1 fig., 6 photos, 31 references.
In English with abstract in French.

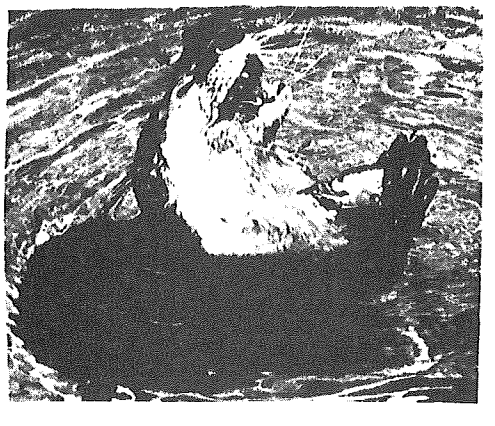
Authors abstract.

FOOD ECOLOGY OF OTTERS IN NATAL, SOUTH AFRICA.

D.T. Rowe-Rowe, Natal Parks Board, Postbox 662, Pietermaritzburg, 3200 South Africa.

Food habits of otters Aonyx capensis (Schinz) and Lutra maculicollis Lichtenstein were studied in trout and non-trout areas by collecting and examining faeces. In both habitats Aonyx lived almost entirely on freshwater crabs and frogs, and principal items in Lutra's diet were crab, fish, and frog. Seasonal variations were observed in both otters' diets, with most crabs taken during summer and the incidence of fish being highest during winter. These variations were explained in terms of crabs retreating into inaccessible places during winter, and fishes' efficiency of locomotion being reduced in cold water. Both otter species took more small fish that larger specimens. It was concluded that small fish (<200 mm) were easier to capture than larger ones, and were more abundant. Food ecology of otters was compared with that of the water mongoose Atilax paludinosus (G. Cuvier) which lived chiefly on crabs, small mammals, birds, and frogs. Although there was from 58-66% food overlap between Atilax and the otters, Atilax utilises a wider range of habitats than do otters, and does not exploit certain habitats which are exclusive to lutrines. The otters occupy restricted niches, whereas Atilax occupies a wide niche.

OIKOS, 28, 210-219, 1977.
7 figs., 23 references.
In English with abstract in Russian.



Authors abstract.

PREY CAPTURE AND FEEDING BEHAVIOUR OF SOUTH AFRICAN OTTERS.

D.T. Rowe-Rowe, Natal Parks Board, Postbox 662, Pietermaritzburg, 3200 South Africa.

Observations on the predatory behaviour of captive Aonyx capensis and Lutra maculicollis were made. A. capensis captures its prey with its fore-feet, and L. maculicollis captures all prey in its mouth. Whereas L. maculicollis relies on sight only to locate prey, A. capensis is adept at obtaining food hidden from view, by feeling for it with its hand-like fore-feet. The larger A. capensis, with its robust molariform teeth is better equipped than L. maculicollis for crushing hard structures, such as the carapaces of large crabs. The diets of otters in the wild are discussed in relation to the behaviour observed in captivity.

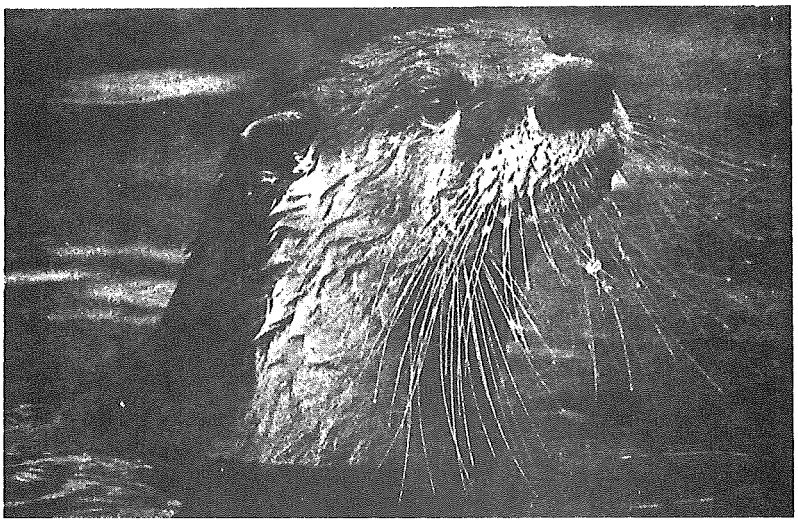


Figure 6. Head of clawless otter showing the numerous long vibrissae – cf. those of the spotted-necked otter in Fig. 4.

The Lammergeyer, 23, May 1977, 13-21.
6 photos, 7 references.

Authors summary.

● THE VARIATIONS IN THE PREDATORY BEHAVIOUR OF THE CLAWLESS OTTER.

D.T. Rowe-Rowe, Natal Parks Board, Postbox 662, Pietermaritzburg, 3200 South Africa.

Predatory behaviour of a captive clawless otter Aonyx capensis was observed under a variety of conditions. In tests involving different species of fish, the capture effort was proportional to the fishes' swimming ability and small fish were more easily captured than large ones. Water temperature, depth, stony substratum, water clarity, and darkness did not greatly affect the otter's crab and frog catching ability, but fish catching efficiency was affected. In prey preference tests selection followed the same rank order as food in the wild.

The Lammergeyer, 23, May 1977, 22-27.
5 tables, 6 references.

Authors summary.

● TERMIN URODZENIA A PRZYDATNOŚĆ HODOWLANA LISÓW POLARNYCH.

(Birth date of polar foxes and their performance).

Jadwiga Ocetkiewicz, Henryk Wojtacha, Instytut Zootechniki, ul. Sarego 2, 31-047 Kraków, Poland.

The investigations were carried out on polar foxes during 1973 and 1974. In each year the young were divided into two groups: born till the 15th of May and after the 15th of May. Each group consisted of males and females. During the whole period of the somatic development the animals were fed ad libitum on a diet containing 65-70% of meat component and were systematically weighed and measured.

No statistical differences have been stated between animals from earlier and later kittenings in either body weight or body size

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at 24 weeks of life. The results show that the development of foxes in correct feeding conditions proceeds identically regardless of the birth date. Therefore the earliest date of birth is by no means the condition of decisive and essential importance at the selection of youth to the basic herds.

Rocz. nauk. Zoot. T. 5, 1 (1978)111-114.
2 tables, 6 references.
In Polish with English subtitles and abstract in English and Russian.

Authors abstract.

● ARE MINK REALLY PESTS IN BRITAIN.

Ian Linn, Paul Chanin, Univ. Exeter, Dept. Biol. Sci., Exeter, EX4 4QD Devonshire, England.

The mink has a bad name in Britain. Ever since this American member of the weasel family escaped from fur farms in the 1950s, and became established as part of our countryside fauna, it has been maligned as a serious predator of man's domestic stock, and of waterfowl and other waterside animals which are valued for various reasons... On the whole, through, how should we rate this creature? Foe, friend, or not quite either? So far we have considered predation and its possible effects, but it is important to bear in mind that prey populations are on the whole well able to withstand moderate levels of predation mortality without being depleted excessively. Birth rates are pitched to allow for cropping by predators, and many prey are doomed to die, whether the predator gets them or not. So far as wild life is concerned, this means that the effect of mink is in most places much less than we expect (or fear?)... Certainly there is no evidence of wide-scale ravaging of domestic stock, jo justify a large and expensive control campaign against the mink. As regards competition with otters, there is still no substantial evidence that

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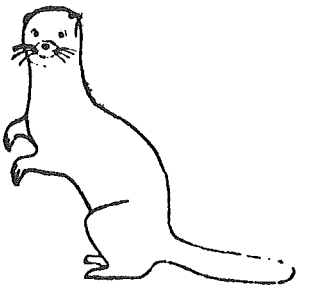
this occurs, and those who wish to see the return of the otter to its previous abundance must seek another answer. Destruction of mink will not provide the result they desire.

New Scientist, 77 (1o92), 56o-562.
3 photos.



● RESULTATER AF FANGST MED KASSEFÆLDER.

(An example of catch results with cage traps).

Birger Jensen, Vildtbiologisk Station, Kalø, 841o Rønde, Denmark.

From September-November in 1969 and 197o, small mustelids were captured in southern Jutland in connexion with rabies work. An experienced gamekeeper carried out the trapping, using cage traps, the only type permitted under the Danish Game Act for mammals, with the exception of moles, voles, rats and mice. Full details were kept of the capture work, most of the species caught being retained. The numbers of the main species or groups caught in each of the three types of trap used are given i Table 1,, while species caught by change are mentioned on p. 131. The effect of trap size and the use of bait, together with the deposition of odour in traps, is discussed on p. 131, but as it was not possible to carry out experiments for direct comparison, no definite conclusions could be made. The number of hedgehogs captured per week is shown in Fig. 3, to illustrate how late this species is active in autumn before entering hibernation. In Table 2, the age composition of the mustelids collected is shown, based on incremental lines in canine tooth cement. The fauna captured in each locality are discussed on p. 134, and in particular, the large number of yellow-necked field mice taken in many localities was notable. This species has been recorded previously from only a few places in southern Jutland, but is undoubtedly widespread and numerous there. In this connexion,

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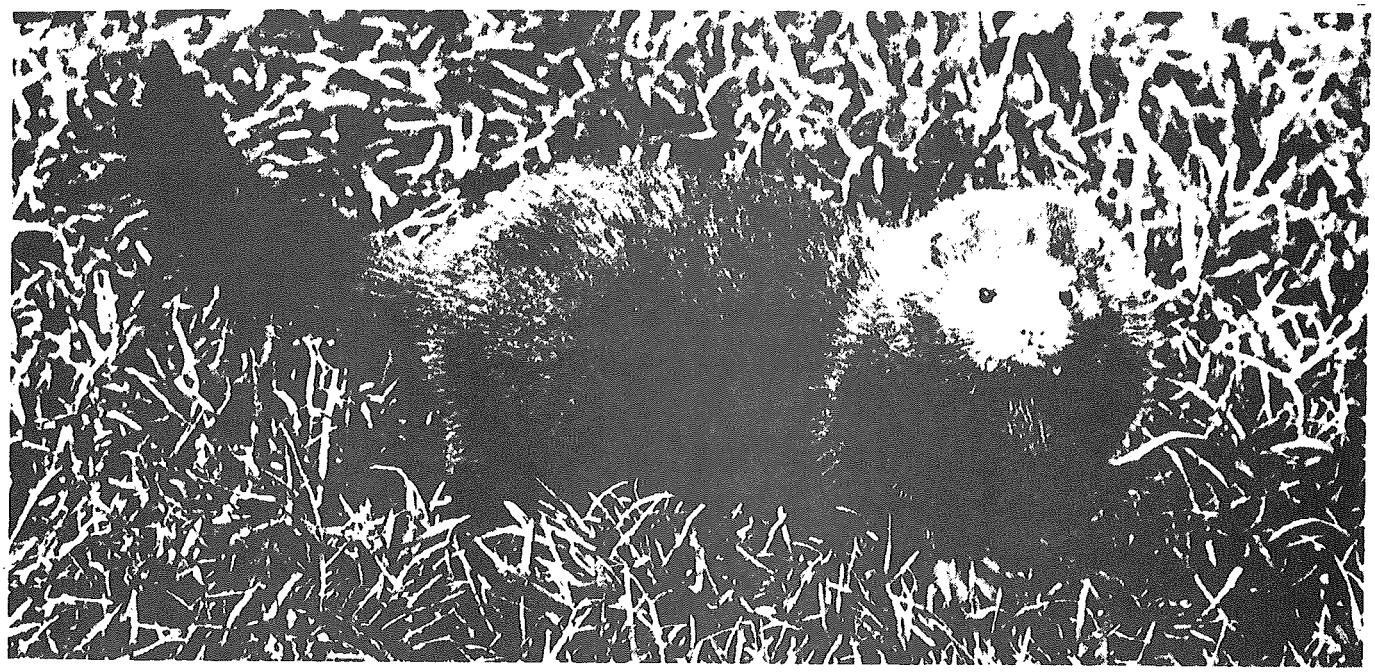
it is suggested that it is not absent from western Jutland, as is otherwise claimed in quite a few handbooks and field guides.

Natura Jutlandica, 2o, 129-136, 1978.
3 figs., 2 tables, 25 references.
In Danish with English abstract.

Authors abstract.



D. N. Dalton/NHPA

● IMMUNOGENETIC STUDY ON THE POLYMORPHISM OF SERUM α_2-LIPOPROTEINS IN MINK. II. IDENTIFICATION OF ALLOTYPES Lpm-7 AND Lpm-8 AND GENETIC CONTROL OF SEVEN MARKERS OF THE Lpm SYSTEM.

O.K. Baranov, V.I. Yermolaev, D.K. Belyaev, Academy of Sciences of the USSR, Siberian Branch, Institute of Cytology and Genetics, Novosibirsk-9o, USSR.

By means of alloimmunization of mink, two new antigens, Lpm-7 and Lpm-8, were detected in their sera. Lpm-7 and Lpm-8 allospecificities were referred to a very high density α_2-lipoprotein (Lpm) by the following criteria: histochemical tests, immunoelectrophoresis, preparative ultracentrifugation, and coalescence of alloprecipitates with heteroprecipitates in double diffusion tests. Genetic analysis indicated that Lpm-7 and Lpm-8, together with the earlier described Lpm-1, Lpm-2, Lpm-3, Lpm-4, and Lpm-5, share a common immunogenetic system. Polymorphism for the seven markers is conditioned by the genetic units Lpm^{8}, Lpm^{4}, $Lpm^{4,8}$, $Lpm^{4,7}$, $Lpm^{3,4,8}$, $Lmp^{1,8}$, $Lpm^{1,2,7}$, and $Lpm^{2,4,5,7}$, which behave as alleles. Of these units, the latter six are probably haploid sets of closely linked genes.

Biochemical Genetics, Vol. 16, no.5/6, 1978, 4oo-413.
23 references.
In English.

Authors abstract.

● PRÓBA OSZACOWANIA INDEKSU SELEKCYJNEGO DLA NOREK STANDARD.

(An attempt to evaluate a selection index for standard mink).

Irena Narucka, Jerzy Gedymin, Instytut Hodowli i Technologii, Produkcji Zwierzecej Akademii Rolniczej, ul. Wolyńska 33, 6o-637 Poznań, Poland.

The selection index was based on the following three traits of ▶

4163 mink taken into account during the autumn licence: x_1-coat colour, x_2-live weight (as the size indication), x_3-structural quality of coat. The genetic parameters h^2 and r_G were estimated from the paternal component, basing on the evaluation of individual animals. All three traits were assumed to have the same economic importance-1.

The index obtained was:

$$I = (x_1 - \bar{x}_1) + 0.147\ (x_2 - \bar{x}_2) + 1.970\ (x_3 - \bar{x}_3)$$

where $\bar{x}_1$, $\bar{x}_2$ and $\bar{x}_3$ stand for the mean values of the traits calculated for one year, one farm and one sex. The calculated exactness of the index was R=0.398 which pointed to its rather moderate efficacy.

Rocz. nauk. Zoot. T. 5, 1, 1978, 101-109.
6 tables, 6 references.
In Polish with subtitles in English and abstract in English and Russian.

Authors summary.

Your Index was too low.

LEVELS OF OESTROGEN AND PROGESTERONE IN THE PLASMA OF THE RACCOON DOG (NYCTEREUTES PROCYONOIDES) DURING OESTRUS AND PREGNANCY.

Maija H. Valtonen, E.J. Rajakoski and P. Lähteenmäki
Department of Veterinary Medicine, University of Helsinki, 00710 Helsinki 71, and Steroid Research Laboratory, Department of Medical Chemistry, University of Helsinki, 00170 Helsinki 17, Finland.

Changes in the concentrations of the ovarian steroid hormones, oestradiol-17β and progesterone in the plasma of the raccoon dog were investigated during the oestrous cycle and pregnancy. Blood samples of six female raccoon dogs were collected from the saphenous vein two or three times a week from the first signs of approaching oestrus until 1 week after the end of oestrus and thereafter only once a week.

The level of oestradiol-17β reached a maximum (highest individual value 55 pg/ml) during pro-oestrus or at the beginning of oestrus. After coitus, the concentration of oestrogen fell rapidly to a low or undetectable level and remained low during early pregnancy. The level then rose slightly between days 13 and 26 of gestation and declined again towards term.

The concentrations of progesterone were low during pro-oestrus. During, oestrus, the concentrations increased rapidly and rose to a maximum (highest value measured 23-4 ng/ml) during the first half of pregnancy. From the middle of pregnancy the level of progesterone fell steeply to less than 5 ng/ml and values measured after parturition were below 1 ng/ml. The profiles of the concentrations of sex steroids in the plasma of the canine species, dog, fox and raccoon dog are surprisingly similar.

Journal of Endocrinology, 76, 549-550, 1978.
1 fig. 9 references.

Authors abstract.

RELATION BETWEEN DAYLIGHT RATIO, PLASMA PROGESTERONE LEVELS AND TIMING OF NIDATION IN MINK (Mustela Vison).

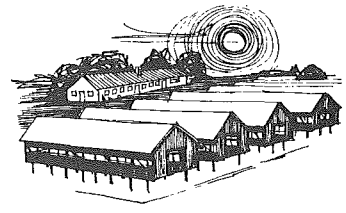
Catherine Allais, Lise Martinet

Station centrale de Physiologie animale, I.N.R.A. 78350 Jouy-en-Josas, France

Mink were mated between 17 February and 22 March. In females kept in natural daylight. concentrations of progesterone, measured by radioimmunoassay, began to rise between 25 and 30 March, whatever the date of mating. After reaching peak values of 40-160 ng/ml, progesterone concentrations decreased before the end of pregnancy. In females given 14 h light/24 h immediately after mating, the rise of progesterone began a few days earlier, indicating that the extra light induces earlier progesterone secretion, nidation and parturition.

J. Reprod. Fert., 1978, 54, 133-136.
1 Table, 1 fig., 13 references.
In English.

Authors abstract.



OESTROGEN AND PROGESTERONE CONCENTRATIONS IN PERIPHERAL BLOOD IN PREGNANT RED FOXES (VULPES VULPES).

M. Bonnin, M. Mondain-Monval, B. Dutourne, Laboratoire d'Endocrinologie Expérimentale, Domaine de Carreire-Bordeaux Université II, rue Léo Saignat, 33076 Bordeaux Cedex, France.

Oestrogen levels were low during most of gestation, but there was a significant increase ($P<0.05$) in oestradiol concentrations at implantation. Early pregnancy was characterized by high levels of progesterone which decreased significantly ($P<0.001$) thereafter,

▶

but there was no decline in progesterone or rise in oestrogen levels at parturition. There was no difference in the length of progesterone secretion between pregnant and non-pregnant females.

J. Reprod. Fert. 1978, 54, 37-41.
2 tables, 1 fig., 17 references.
In English.

Authors abstract.

● MONOGAMOUS RACCOON DOG (NYCTEREUTES PROCYONOIDES) AND POLYGAMOUS MATING IN FUR FARMING.

Valtonen M.H. and J.I. Mäkelä.
Institute of Veterinary Medicine, University of Helsinki, 00710 Helsinki 71, and Helve Research Farm, 02880 Veikkola Helsinki.

Reproduction of most wild canids is caracterized by a preliminary stage of pairing up. In wild life raccoon dogs pair up in autumn, although mating does not take place before the next spring. During the first few years the raccoon dogs originating from the wild population were housed in couples in Finnish farms. For economic reasons, it was important to reduce the number of males needed for breeding and polygamous mating trials were performed during three seasons. Two methods were used: The male was placed in the female's box for 3-4 days while the signs of oestrus where strongest, or the male was regularly placed in the female's cage every two days during the whole heat period. The latter mating system gave the best results, the young production counted as the ratio of young to the total number of females being 2.07. The results were from an economical viewpoint not very promising. They proved, however, that reproduction of raccoon dogs in farm conditions was possible also by polygamy.

▶

When adapted to farm conditions, raccoon dogs seemed to show stronger symptoms of heat. So farmers were advised, as experience increases, to apply to raccoon dogs the mating system used with foxes. In this system, the female is placed in the male's box only when the signs of oestrus are best and is kept there until mating is seen or one day at the most. This is repeated one or two days later, if the signs of heat are still evident. About one third of the raccoon dog females is now bred by polygamy and the young production have increased to 4.3. However, the amount of barren females is still as high as 33 %.

1 st. World Congress on Ethology Applied to Zootechnics. Symposia 4-04. Madrid 1978.

Authors abstract.

● REPRODUCTIVE FEATURES IN THE FEMALE RACCOON DOG (NYCTEREUTES PROCYONOIDES)

Maija H. Valtonen, E.J. Rajakoski and J.I. Mäkelä
Department of Veterinary Medicine, University of Helsinki, 00710 Helsinki 71, and Helve Research Farm, 02880, Veikkola, Finland.

The raccoon dog has only recently been farmed in Finland and its breeding still involves several problems. Since knowledge of its reproduction was very limited, more information about the oestrous cycle and gestation was needed for adapting this naturally monogamous species to the polygamous mating used in the fur industry. In this study which lasted three seasons, starting in 1974, 20 female raccoon dogs were used in the first two seasons and 14 in the third. All the animals were housed at Helve's Research Farm, Veikkola. During the breeding seasons the animals were inspected daily with respect to the changes occurring in clinical appearance, vaginal cytology and behavior during the oestrous cycle. ▶

The mating seasons of the raccoon dogs investigated were in February and March. The mean duration of pro-oestrus, charactericed by vulval swelling and mucopurulent discharge, was 7.6 $\pm$ 3.5 days (S.D.) ranging from 2 days to 2 weeks. Oestrus, the period when the female was willing to mate, lasted for 3.9 $\pm$ 1.2 days. The alterations in the external genitalia were not as distinct as in the dog and fox. In raccoon dogs leucocytes were precent in vaginal smear and the discharge was mucopurulent throughout the whole proestrus and oestrus. The gestation period was 61.0 $\pm$ 2.0 days, ranging from 59 to 64 days and the mean litter size 5.0 $\pm$ 2.3. In captivity the raccoon dog turned out to be a `shy breeder´, mating taking place during the night or early in the morning. As the animals adapted to captive conditions, the signs of oestrus became more pronounced and coitus could be observed.

Journal of Reproduction and Fertility 51, 517-518, 1977
3 figs. 10 references.

Authors abstract.

HISTOLOGISCHE UNTERSUCHUNG DER KINETIK DER SPERMATOGENESE BEIM MINK (*MUSTELA VISON*)

HISTOLOGICAL STUDIES ON THE KINETICS OF THE SPERMATOGENESIS IN THE MINK (*MUSTELA VISON*)*1

I. SAMENEPITHELZYKLUS IN DER PAARUNGSZEIT. (Cycle of the Seminiferous Epithelium in the Breeding Season).

Toshiro Tiba, Tsune Ishikawa, Akira Murakami, Institut für Veterinäre Obstetrik, Tierärztliche Fakultät, Hokkaido-Universität, Sapporo, Japan.

In order to clarify the origin of the wave pattern of the seminiferous epithelium, the present authors have carried out histological studies of seasonal changes in the seminiferous epithelium of mink testis. The mink's testes begin to increase in size prior to the commencement of the breeding season, and maintain this enlarged size until the height of the season, then they gradually atrophy. Therefore, this species should be very suitable for investigating wave pattern development and regression of the seminiferous epithelium.

The first step necessary for the authors to clarify the wave patterns is to investigate the cycle of the seminiferous epithelium during the height of the breeding season.

We used eight testes from 4 healthy adult male minks, of Pastell breeding, in this study. These testes were fixed with Helly's solution, then sectioned and stained by the thionine-PAS method. ORTAVANT's classification of the cyclic changes occurring in the seminiferous epithelium was used in our study.

The significance of difference in the frequency of stages between each testis was estimated by means of χ^2-test. A high significant difference was obtaine from 8 testes of 4 individuals ($P<0.01$), but the difference of 6 testes excepting 2 of one individual was less significant ($P<0.05$).

The confidence limits of the frequency of stages were evaluated for these 6 testes. The equation for the regression curve of the average frequency of each stage from the 6 testes as a function of the stage was determined by the method of least squares.

In comparing the first 4 stages of the cycle with those of the last 4 a pattern was seen in the mink that is similar to the boar and the rat.

Jap. J. Vet. Res., 16,2&3, 1968, 73-86.
5 tables, 3 figs., 11 references.
In German with English summary.

Authors summary.

II. SAMENEPITHELWELLE IN DER PAARUNGSZEIT. (Wave of the Seminiferous Epithelium in the Breeding Season).

Tosiro Tiba, Tsune Ishikawa, Akira Murakami, Institut für Veterinäre Obstetrik, Tierärztliche Fakultät, Hokkaido-Universität, Sapporo, Japan.

On the basis of the results of the previous study on the cycle of the seminiferous epithelium during the breeding season further investigations were carried out. The present study included morphological and quantitative observations on the wave of the seminiferous epithelium during the same season.

In order to observe the wave in situ, longitudinal sections were ▶

made from dissected portions of the seminiferous tubules isolated from the testes of the same animals as used in the previous study; namely, from 8 testes of 4 healthy adult males of Pastell breed. All sections were fixed with Helly's solution and stained with thionine-PAS. Each segment in the wave was identified according to ORTAVANT's classification of the cycle of the seminiferous epithelium.

The results obtained may be summarized as follows:

1) The course of the wave from the rete testis is irregular, namely, sometimes ascending, sometime descending.
2) The modulation seen in this species is a common phenomenon.
3) In spite of the very frequent occurrence of the modulation, the continuity of the segmental order was always maintained; namely, each segment was always adjacent to segment of the next higher or the next lower number.
4) The lengths of the segment by actual measurement are, on the whole, normally distributed without any transformations.
5) No significant difference was observed in the mean value for the length of each segment among 8 testes, but the difference among the segments was significant ($P<0.001$).
6) From stages 1 to 5, each segment gradually decreased in length, while the length of the segment of stage 6 increased and reached a maximum at stage 7, but at the last stage 8 a decrease occurred.
7) The confidence limits of the relative mean lengths of segment (%) were calculated. The equation for the regression curve of the percentage as a function of the stage was determined by the method of least squares.
8) No significant difference was observed in the distribution of the frequencies of segments among 8 testes.
9) The confidence limits of the frequency of segments were calculated. The equation for the regression curve of the frequency as a function of the stage was determined by the method of least squares.
10) No definite conclusion was obtained from our statistical analyses on the frequency of stages in the terminal segment of the isolated seminiferous tubule.

On the basis of these results the present authors have reached the following conclusions: From a pure morphological viewpoint, it is almost impossible to find any regularities in the wave of the seminiferous epithelium of the mink, except for the continuity of the segmental order; but when quantitatively investigated, it can be definitely shown, that the wave of the seminiferous epithelium is subject to some regularities.

Jap. J. Vet. Res., 16, 4, 1968, 159-181.
11 tables, 6 figs., 2 photos, 14 references.
In German with English summary.

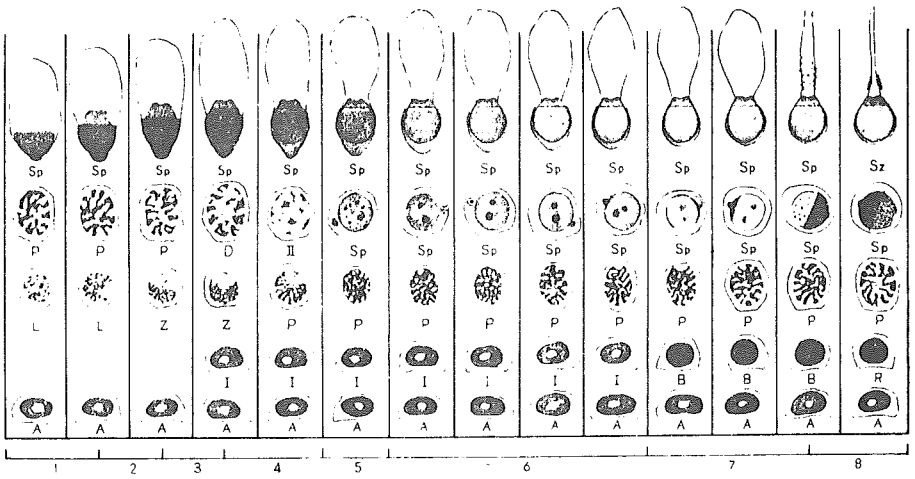
Authors summary.

III. EINE MODIFIZIERTE EINTEILUNG DER KEIMZELLGEMEINSCHAFTEN FUER DIE UNTERSUCHUNG DER SPERMATOGENESEKINETIK UNMITTELBAR VOR DEN PAARUNGSZEITEN (7. UND 19. LEBENSMONAT).

Toshiro Tiba, Institut für Veterinäre Obstetrik, Tierärztliche Fakultät, Hokkaido-Universität, Sapporo, Japan.

To be able to compare the cellular associations of the seminiferous epithelium in the pre-breeding season with those during the breeding season, the classification for the latter ought to be modified reasonable. The modification was carried out on the working hypothesis that the conditions of construction of the cellular association in the breeding season held good in the beginning or recommencement of the spermatogenesis immediately before the breeding seasons. A reasonability of the modification can be verified by the actual observation with the aid of the modified classification on the cellular associations concerned. The results of the verification would be able to suggest any difference in the kinetics of spermatogenesis in different periods of the reproductive cycle.

ABBILDUNG 1 *Zellgemeinschaft in jedem Stadium des Samenepithelzyklus in der Paarungszeit (nach* TIBA *et al.*[1])



A: A-Spermatogonien
I: I-Spermatogonien
B: B-Spermatogonien
R: Ruhende primäre Spermatozyten
L: Leptotän
Z: Zygotän
P: Pachytän
D: Diakinese
II: Sekundäre Spermatozyten
Sp: Spermatiden
Sz: Spermatozoen

Jap. J. vet. Res. 21, 4, 1973, 1o5-111.
2 tables, 2 figs., 2 references.
In German with English summary.

Authors summary.

IV. ZELLGEMEINSCHAFTEN IM SAMENEPITHEL UNMITTELBAR VOR DEN PAARUNGSZEITEN (7. UND 19. LEBENSMONAT).

Toshiro Tiba, Institut für Veterinäre Obstetrik, Tierärztliche Fakultät, Hokkaido-Universität, Sapporo, Japan.

From the viewpoint of construction of the cellular association in the seminiferous epithelium morphological and quantitative observations were carried out on the spermatogenesis in two different generations of mink immediately before the beginning or recommencement of the breeding season, i.e. young animals in the puberty (7 months old) and adult (19 months old) minks. Two different types of cellular associations were observed:
1) cellular associations which develop on the same principle as in the breeding season;

2) cellular associations whose origin can not be explained directly from our knowledge of the construction of the cellular associations in the breeding season. These findings support the presumption that there is another feature in the kinetics of spermatogenesis in the pre-breeding season as compared with those during the breeding season.

Jap. J. Vet. Res. 21, 4, 1973, 112-123.
5 tables, 14 figs., 21 references.
In German with English summary,

Authors summary.

V. GONOZYTEN UND GONOZYTEN-AEHNLICHE ZELLEN UNMITTELBAR VOR DEN PAARUNGSZEITEN (7. UND 19. LEBENSMONAT).

Toshiro Tiba, Institut für Veterinäre Obstetrik, Tierärztliche Fakultät, Hokkaido-Universität, Sapporo, Japan.

Morphological and quantitative observations were performed on the precursor of the spermatogonial stemcell in two different generations of mink immediately before the beginning or recommencement of the breeding season, i.e. immature (7 months old) and adult (19 months old) minks. The sex cord of the immature animal has the gonocyte, while the seminiferous epithelium of the adult possesses gonocyte-like cells. They are much alike not only in their morphological features but also in their functional behaviour. The gonocyte-like cells might be regarded as the precursors of the spermatogonial stemcells in the recommencement of the spermatogenesis. Their origin, however, remains unexplained.

Jap. J. vet. Res., 21, 4, 125-138, 1973.
7 tables, 8 photos, 32 references.
In German with English summary.

Authors summary.

VI. SAMENEPITHELWELLE UNMITTELBAR VOR DEN PAARUNGSZEITEN (7. UND 19. LEBENSMONAT).

Toshiro Tiba, Institut für Veterinäre Obstetrik, Tierärztliche Fakultät, Hokkaido-Universität, Sapporo, Japan.

In order to observe the wave of the seminiferous epithelium in situ, longitudinal sections were made from dissected portions of the seminiferous tubules isolated from the testes of two different generations of mink, i.e. immature (7 months old) and adult (19 months old) minks. The results are as follows:
The first signs of the establishment of the wave pattern develop at the beginning or recommencement of spermatogenesis. It has also been difinitely shown that there is a large number of remarkable cellular associations whose origin can not be explained directly from our knowledge of the wave during the breeding season. Moreover, very irregularly arranged segments were found with extra ordinary frequency. This indicates that these segments do not follow the law of continuity of the segmental order in the breeding season. On the basis of these results the author has reached the following conclusion: The conditions of construction of the wave in the pre-breeding season are not exactly similar to those during the breeding season.

Jap. J. vet. Res., 21, 4, 1973, 139-154.
3 tables, 19 figs., 39 references.
In German with English summary.

Authors summary.

VII. CELLULAR ASSOCIATION IN THE SEMINIFEROUS EPITHELIUM IN THE PRE-BREEDING SEASON (16 MONTHS OLD).

Eisaburo Deguchi, Dept. of Vet. Obstetrics, Faculty of Vet. Med., Hokkaido University, Sapporo o6o, Japan.

The cellular association of the seminiferous epithelium in five minks, 16 months old, was quantitatively observed. Two different types of cellular associations were found. One was quite similar to the cellular associations observed in the breeding season and could be divided into eight steps. The other did not correspond to any step. Significant differences were noted among the relative frequency of the eight steps from six sites of both testes. The decrease in the number of each generation of the spermatogenic cells was related to the degenerations of the primary spermatocytes at the pachytene phase in steps 6-8 and of the intermediate-type spermatogonia in step 6.

Jap. J. vet. Res., 26, 1-1o, 1978.
5 tables, 1 fig., 2 photos, 15 references.
In English.

Authors summary.

REPRODUCTION OF RACCOONS (PROCYON LOTOR) IN NORTH DAKOTA.

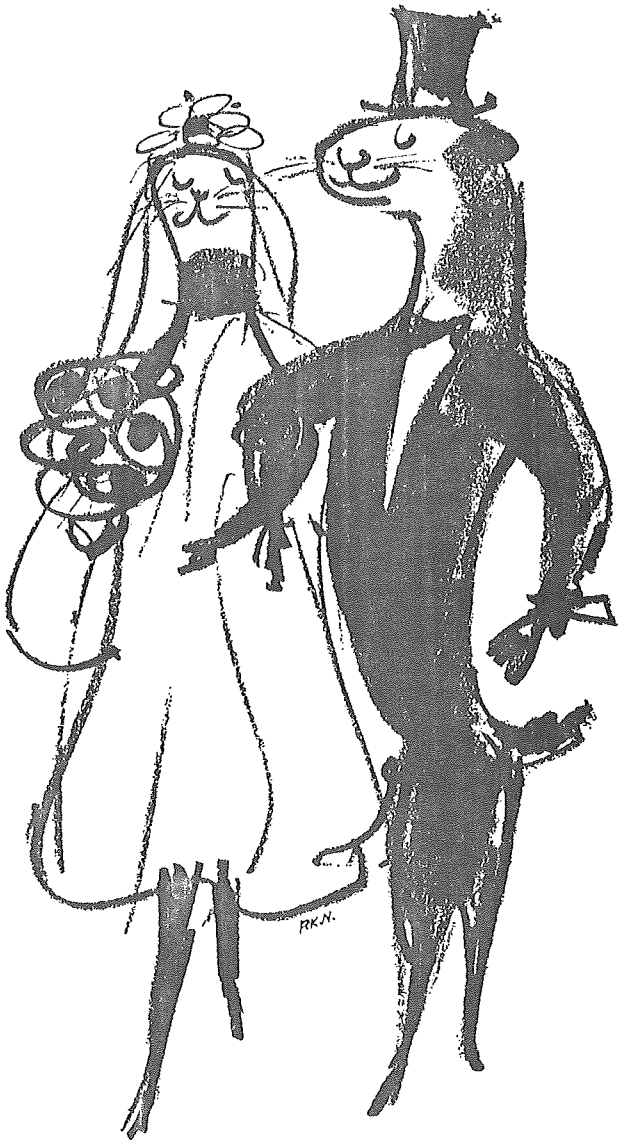
Erik K. Fritzell, Dept. of Entomology, Fisheries and Wildlife, University of Minnesota, St. Paul 551o1, USA.
(Present address: Northern Prairie Wildlife Res. Ctr., Jamestown, North Dakota 584o1, USA).

Necropsies and observations of captive and radio-equipped individuals provided reproductive data from a raccoon population in the northern prairies. The mean parturition date of adult females was 8 May and the mean litter size was 4.8. Only two of the

14 yearling females examined prior to 1 July were pregnant; they has estimated parturition dates of 2o May and 22 June. Penes of most yearling males became extrusible in July or August. Testes weights and sperm smears suggest that yearling males in North Dakota are not reproductively active. Reproductive patterns of raccoons near the northern periphery of their range and those of lower latitudes are compared and discussed.

American Midland Naturalist, 1oo, 1, July, 1978, 253-256.
1 fig. 14 references.

Authors abstract.



Laboratoire des Pelages
Toisons et Fourrures.

THE STORAGE OF COMPOSED FOODS FOR RATS AND MINKS AFTER ADDITION OF PRESERVING AGENTS. MICROBIOLOGICAL EVOLUTION.

B. Cahagnier, J.-P. Melcion, Cuc Thi N'Guyen, Jeanne Poisson*, J. Rougeot**

Laboratoire de Biophysique des Aliments et de Technologie des Aliments pour Animaux, Centre de Recherches Agro-alimentaires, I.N.R.A. 44072 Nantes Cédex, France

* Laboratoire de Recherches Pathologie végétale, I.N.R.A., I.N.A. 16 rue Claude-Bernard 75231 Paris Cédex 05, France

** Laboratoire des Pelages, Toisons et Fourrures, I.N.R.A. 78350 Jouy-en-Josas, France

It is difficult to preserve food for small animals. The water content in mink mash prepared from complete meals is about 50 to 55 p. 100, and bacterial and fungi germs multiply actively. In order to prevent these disavantages, we propose the addition of sorbic acid, and propionic acid, which are antimicrobial and non-toxic preserving agents for warm-blood animals.

Both preserving agents lower the mold germ content of the mash and keep it at a low level. Propionic acid has a higher inhibiting effect than sorbic acid on the multiplication of bacteria other than Lactobacillus. At the same time, propionic acid seems to have a stimulating effect on food consumption by mink.

Ann. Technol. Agric., 1977, 26, 59-77.

9 figs. 16 references.

In French with English summary.

Authors summary.

TRIMETHYLAMINE OXIDE IN MINTAJ AND SOME OTHER SPECIES OF FISH USED AS MINK FEED

Tuomo Kiiskinen and Lea Huida, Agricultural Research Centre,
Department of Animal Husbandry,
01300 Vantaa 30 Finland

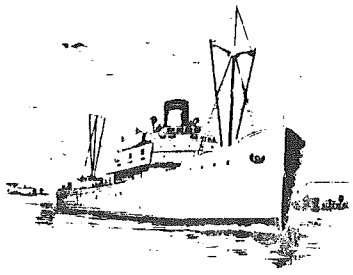
Determinations of trimethylamine oxide (TMAO), trimethylamine and formalin content of mintaj fish (Theragra finnmarchica), used in feeding experiments on Helve's Research Farm, were carried out in 1972-1977. As control respective values were determined of other species of fish mainly cod and cod racks and of one sample of Krill shrimps (Euphasia superba).

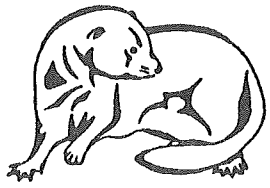
In 1973 the TMAO-values were especially high, 180-240 mg/100 g. The same year, according to skin statistics, respectively the number of cotton fur pelts was unusually high, e.g. in dark mink 3.3 %.

In 1975-1977 the high TMAO-values of cod racks, 20-40 mg/100 g indicate that the samples have included coal fish or whiting. The TMAO content of Krill shrimps was c. 100 mg/100 g.

Turkistalous 50, 1978: 418-420
Finsk pälstidskrift 50, 1978: 416-418
1 table, 19 references. In Finnish and Swedish.

Author's abstract





Laboratoire des Pelages
Toisons et Fourrures.

USE OF GLASS BEADS AS DIGESTIVE INDICATORS IN THE MINK.

J. Rougeot*, Geneviève Charlet-Lery**, A. Andersen***

* Laboratoire des Pelages, Toisons et Fourrures, I.N.R.A. 78350 Jouy-en-Josas, France

** Laboratoire de Physiologie de la Nutrition, I.N.R.A. 78350 Jouy-en-Josas, France

*** Faculté des Sciences de l'Agriculture et de l'Alimentation, Université Laval, Québec, Canada

The digestive tract of the mink is very simple. We therefore presumed that calibrated glass beads (50 µm for chromatography columns) could be used as external indicators for studying the rate of passage of digesta through this tract. Using the Kjeldahl method until total solubilization, the amount of glass beads was rapidly and accurately determined. When mixed in vitro with faeces, all beads were recovered. But, because the mink wastes feed, the intake of the glass beads was overestimated, as it exceeded the amount of beads recovered in the faeces (91.33 ± 0.95 p. 100) and digesta (90.0 ± 1.00 p. 100). However, they were all recovered when the feed intake was fully controlled.

Ann. Zootech., 1978, 27(3), 439-441.

6 references.

In French with English summary.

Authors summary.

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THE INFLUENCE OF SULFURIC ACID PRESERVED HERRING ON THE PASSAGE TIME THROUGH THE GASTRO-INTESTINAL TRACT IN MINK.

N. Enggaard Hansen, Dept. of Animal Nutrition, Royal Veterinary and Agricultural University, Copenhagen, Denmark.

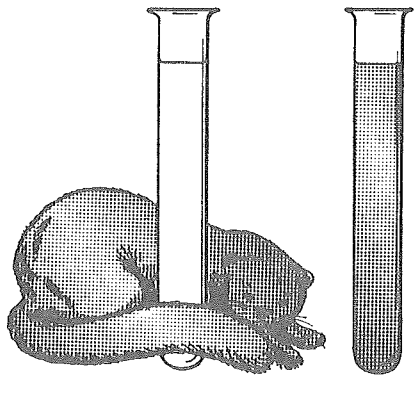
The influence of sulfuric acid on the passage time in mink has been examined for rations containing 0, 10, 20 and 30 pct. sulfuric acid preserved herring. Chromium(III)oxide was used as a marker. A method to dissolve and quantitatively determine chromium in faeces is described.

As mink defecate only a few times within the passage time it was not possible with reasonable accuracy to evaluate the effect of the experimental rations on basis of the excretion curves. There was, however, a rectilinear relationship between the logarithm of time and the logarithm of the percentage of cumulated marker.

The content of sulfuric acid in the ration has caused a statistically significant increase of the passage time in the group which received the largest amount of sulfuric acid preserved herring. Addition of calcium hydroxide has no influence on the passage time. Sodium hydroxide, on the contrary, reduces the passage time to the level of the control group.

Z. Tierphysiol., Tierernährg. u. Futtermittelkde. 1978, Vol. 4o, H. 6, 285-291.
3 tables, 2 figs., 16 references.
In English with German summary.

Authors summary.



L'IMPIEGO DEGLI IDROLIZZATI DI CUOIO NELL'ALIMENTAZIONE CUNICOLA.

(Hydrolisates of leather in the feeding of rabbits.)

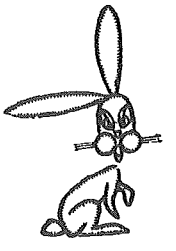
Paolo Veritá, Mario Orlandi, Università di Pisa, Inst. di Zootecnica Zoognostica, Facolta di Medicina Veterinaria, Italy.

A feeding trial on rabbits has been conducted with a concentrated food containing hydrolized leather, which sostituted completely the meat meal that was present in the concentrated food given to the control rabbits.

The results have been:
- the average daily weight increment has been constantly superior in the experimental rabbits;
- the feed intake has been almost identical for both groups;
- the food conversion efficiency has been inferior for the experimental group;
- the dressing percentage, the skin weight, the weight of the components of the fifth quarter have been not statistically different among both groups;
- the fat and protein contents in the meats of the experimental group have been respectively superior and inferior of 4% compared to the control group;
- the ashes percentage in the meats has not been influenced by the diets;
- the fatty acids composition of the perirenal fat has been similar in both groups.

Quademi Scientifici di conglicoltura, no. 1o, 1977. X/47-X/51.
7 tables, 3 references.
In Italian with summary in French.

Authors abstract.



SPONTANEOUS ALEUTIAN DISEASE IN FERRETS.

P.Y. Daoust, D.B. Hunter, Dept. of Vet. Path., Western College of Vet. Med., University of Saskatchewan, Saskatoon, Saskatchewan S7N OWO, Canada.

Aleutian disease was diagnosed on the basis of histopathological changes in dead animals and the demonstration of serum antibodies against Aleutian disease viral antigen in survivors among a group of ferrets (Mustela putorius) from an experimental colony.

Can. vet. J. 19, 133-135, May 1978.
2 photos, 16 references.
In English with summary in French.

Authors summary.

BADANIA SEROLOGICZNE W DIAGNOSTYCE GRUZLICY NOREK. (Serological investigations in the diagnostics of tuberculosis in minks).

Jadwiga Ocetkiewicz, Jan W. Stefan, Henryk Wojtacha, Zaklad Hodowli Drobnego 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 in 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. 34o 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 "Tuberculognost" 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. 1 (1974) 53-57.
16 references.
In Polish with summary in English and Russian.

Authors summary.

PARASITES OF RED FOXES IN NEW BRUNSWICK AND NOVA SCOTIA.

H.J. Smith, Animals Pathology Laboratory, Health of Animals Branch, Agriculture Canada, Atlantic Area Laboratory, P.O. Box 141o, Sackville, New Brunswick, EOA 3CO.

Sixty-one red foxes from New Brunswick and Nova Scotia were examined for helminths. Alaria americana, A. arisaemoides, A. mustelae, Cryptocotyle lingua, Echinostoma revolutum and Metorchis conjunctus, Capillaria aerophila, Crenosoma vulpis, Toxocara canis, Uncinaria stenocephala and Taenia crassiceps were found. Approximately 67% of the foxes examined were clinically affected with Sarcoptes scabiei mange.

Journ. of Wildlife Diseases, 14, July, 1978, 366-37o.
1 table, 25 references.

Authors abstract.

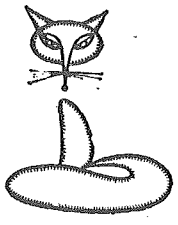
LABORATORY OBSERVATIONS ON THE FOX (VULPES VULPES CRUCIGERA) IN DYFED DURING THE WINTERS OF 1974/75 AND 1975/76.

P.W. Swire, Ministry of Agric., Fish. and Food, Vet. Investigation Centre, Jobswell Road, Johnstown, Carmarthen.

Examinations were made of 189 foxes collected in South-West Wales during the winters of 1974/75 and 1976/76. Biological and pathological data were recorded and the diet of foxes during the periods was investigated. Comparative studies of the dentition of the fox and other carnivores were also made. In general, the wild fox population showed little evidence of intrinsic disease or of disease likely to be transmitted to other domestic stock.

Br. vet. J. 1978, 134, 398-4o5.
3 tables, 18 references.

Authors summary.



PASSAGEVERSUCHE MIT EINER VARIANTEN DES TOLLWUT-IMPFSTAMMES ERA BEI WILDLEBENDEN SPEZIES (ONDATRA ZIBETHICA AND RATTUS NORVEGICUS) - EIN BEITRAG ZUR ORALEN IMMUNISIERUNG VON FUCHSEN GEGEN TOLLWUT.

(Passage experiments with a variant of the vaccinal rabies virus strain ERA in wild-living species (Ondatra zibethica and Rattus norvegicus) - A contribution to oral immunization of the fox against rabies.).

G. Wachendörfer, R. Farrenkopf, W. Lohrbach, U. Förster, J.W. Frost, W.A. Valder, Staatlichen Veterinärundersuchungsamt, Deutschordenstr. 48, 6ooo Frankfurt Main 71.

1. During 1o passages of ERA-BHK-21 virus in 95 muskrats (Ondatra zibethica) by the intracerebral intramuscular and oral routes residual pathogencity could be demonstrated in 61 (64 percent) of these animals. Reisolation of the virus from peripheral

tissues (brown fat, salivary gland) was only sporadically successful in the course of the passages all inoculation routes resulted in an increase of infectivity titres in the brain indicating an adaptation of the vaccinal virus strain to the susceptible host species.

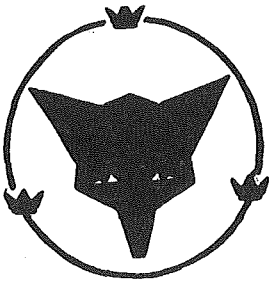
After intramuscular application of the passaged virus to foxes one out of 14 developed a panmyelitis and leptomeningits. The findings in this one fox suggest, that by the passages in muskrats a more pathogenic variant was selected.

2. Of the rats 23 (38 percent) of the 6o intracerebrally and orally infected animals became rabid during the passage experiments. Centrifugal spread of the virus was as rare as in the muskrats. A tendency of adaptation to the rat can be demonstrated by the course of the infectivity titres of the brains after intracerebral inoculation. No indications for increased pathogenecity of the virus passaged in rats were seen after intramuscular infection of foxes and raccoons.

3. The residual pathogenecity of the vaccinal rabies virus strain ERA, as ascertained for the first time also in passage experiments, and its apparent tendency to adaptation exclude its use for the oral vaccination of foxes in rabies control. Since the concept of oral vaccination is primising, research on innocuous living vaccines should be intensified.

Deutsche Tierärztl. Wochenschrift, 85, 279-285. 1978.
2 tables, 4 figs., lo references.
In German with English summary.

Authors summary.



EXPERIMENTAL INFECTIOUS BOVINE RHINOTRACHEITIS VIRUS INFECTIONS OF ENGLISH FERRETS (MUSTELA PUTORIUS FURO L).

P.C. Smith, Dept. of Rural Practice, Coll. of Veterinary Med., Temporary Office Bldg., University of Tennessee, Knoxville, TN 37901, USA.

Intranasal and intraperitoneal exposure of English ferrets (Mustela putorius furo L) to infectious bovine rhinotracheitis virus caused acute and chronic infections of the respiratory tract. The clinical syndrome was characterized by sneezing, coughing, and anorexia from postexposure days (PED) 3 to 7. Mucopurulent exudate was observed in the posterior nares and pharyngeal area of ferrets euthanatized on PED 4 and 8. The virus was readily recovered from the turbinates, respiratory tract epithelium of the pharynx, retropharyngeal lymph nodes, trachea, lungs, and spleen of animals euthanatized on PED 4, but only from the respiratory tract epithelium of the pharynx in ferrets euthanatized on PED 8 and 12.

Results of histopathologic studies revealed an acute suppurative pharyngitis in animals euthanatized on PED 4 and 8. Recrudescence of chronic infection could be elicited by daily intraperitoneal injections of 4.0 mg of dexamethasone. However, daily administration of 2.0 mg of dexamethasone intraperitoneally did not cause more severe clinical disease. Results of serologic studies revealed serum antibody profiles comparable with those expected in experimentally exposed cattle.

Amer. J. of Vet. Res., 39, 8, 1369-1372.
3 tables, 4 photos, 11 references.

Authors summary.

STUDIES ON SYLVATIC ECHINOCOCCOSIS. V. FACTORS INFLUENCING PREVALENCE OF ECHINOCOCCUS MULTILOCULARIS LEUCKART 1863, IN RED FOXES FROM NORTH DAKOTA, 1965-1972.

Delane C. Kritsky, Paul D. Leiby, Coll. of Health-Related Professions, Idaho State University, Pocatello, Idaho 83209, USA.

A total of 1,153 red foxes, Vulpes vulpes, was examined for strobilae of Echinococcus multilocularis from 2 geographic regions in North Dakota during 1965 through 1972. Echinococcus multilocularis was found in 184 (16%) of these foxes. The data including date and location of collection, age and sex of the host, and presence or absence of the cestode were used to assess the relative influence of collection interval (sampling period), climatic season, geographic location, and age and sex of the host on the prevalence of the adult cestode. The rate of infection varied significantly with collection interval, which was probably attributable to annual changes in the overall environment. Seasonally, the highest prevalences were observed during summer (32.4%) followed by spring (25.3%), autumn (13.7%) and winter (6.4%). Differences in prevalence between adult and juvenile foxes and that between male and female foxes were not significant. A 3-factor analysis of variance showed the order of importance of the significant variables to be collection interval, season, and the interaction of collection interval and season. A 4-factor ANOVA, which in addition to the above variables included geographic location, showed that the collection interval-location interaction had significant effects on prevalence. Also, evidence is presented that suggests that density of the definitive host may in part be responsible for annual fluctuation in prevalence.

J. Parasitol. 64, 4, 1978, 625-634.
3 tables, 8 figs., 17 references.

Authors abstract.

● AUFBAU UND PRODUKTIONSWIRKSAMKEIT DER ABTEILUNG PELZTIERE DES BEZIRKSINSTITUTES FUR VETERINÄRWESEN LEIPZIG.

(Organisation and Performance of Fur Animals Section at Veterinary Institute of Leipzig Region).

G. Grohs, U.D. Wenzel, J. Hartung, Bezirksinstitut für Veterinärwesen, Goldschmidtstrasse 21, 7o1 Leipzig, Ger. Dem. Rep.

Organisation and results of veterinary car for mink fur production units in the GDR are reported by the example of the Fur Animal Section at the Leipzig Regional Veterinary Institute.

Monatshefte für Veterinärmedizin, 31, 9/1o, 1976, 35o-352.
1 table.
In German with summary in English and Russian.

Authors summary.

● STOFFWECHSELTORUNGEN BEI FLEISCHFRESSENDEN PELZTIEREN.

(Metabolic Disturbances in Carnivorous Fur-Bearing Animals).

Ulf D. Wenzel, R. Ziessler; Bezirksinstitut für Veterinärwesen Leipzig, Fachgruppe Vet. Pharmakologie-Toxikologie und -Pharmazie der Sektion Tierproduktion und Veterinärmedizin der Karl-Marx-Universität Leipzig, 7o3 Leipzig, DDR.

Without taking into account the classical infectious diseases of fur-bearing animals (distemper, Fort-William-Disease, Aleutian disease, botulism) one still finds that more than 8o per cent of the total losses due to disease are nowadays encountered in the rearing period. Only as few as 15 to 2o percent of the losses concern older animals.

The conclusion drawn from numerous papers and from our own investigation is that about 6o per cent of the total losses

during rearing can be attributed to nutritional deficiencies (decrease of efficiency, clinical illness, animal losses). Thus mink diseases are above all subclinical or manifest diseases during rearing caused by faulty feeding.

Apart from feeding deficiencies (wrong preparation, wrong rationing) and feed deficiencies (certain feedstuff components, foreign matter contained in the feed or tained feed) the various indirect and direct disturbances caused by faulty feeding particularly of fur-bearing animals bear the greatest significance among all nutritional deficiencies (table 1).

Table 1. Nutritional deficiencies in carnivorous fur-bearing animals.

1. Feeding deficiencies.	2. Feed deficiencies.	3. Faulty nutrition.
1.1. Deficiencies in storage and preservation of easily perishable animal feed.	2.1. Non-biological components.	3.1. Supply of energy and essential nutrients above demand.
1.2. Deficiencies in food preparation in the feed room.	2.1.1. Inorganic compounds having a toxic effect.	3.1.1. Food quantity too high.
1.2.1. Insufficient mixing of the ration components.	2.1.2. Organic compounds having a toxic effect.	3.1.2. Energy content of ration too high.
1.2.2. Fermentation of the feed mix.	2.2. Biological compounds.	3.1.3. Ration content of essential nutrients too high.
1.2.3. Infection of the feed mix.	2.2.1. Bacteria and their metabolic products.	3.2. Supply of energy and essential nutrients below demand.
1.2.4. Usage of tainted ration components.	2.2.2. Fungi and their metabolic products.	3.2.1. Food quantity too low.
1.3. Deficiencies in feed distribution.	2.2.3. Mites and their metabolic products.	3.2.2. Energy content of ration too low.
1.3.1. Abrupt change of feed.	2.3. Food structure.	3.2.3. Absence of one or more essential nutrients.
1.3.2. Deficiencies in feed handling within the farm.		
1.3.3. Confusion of feed mixes, ration components or mixed feedstuff.		

We hold the opinion that so far reliable statistical data on the real extent of losses during rearing caused by feeding have not been published yet. It is, however, recognized that on average about 1o to 2o per cent of all mink born die during the rearing period, i.e. one or two kits per litter.

If the fur production in the G.D.R. is calculated to be 35o,ooo, the annual loss amounts to about 35,ooo to 7o,ooo kits. But

this does not account for the total loss caused by rearing disturbances. In addition to the direct losses of young animals there are indirect losses through reduced growth, increased food requirement, prolonged keeping and constitutional weakness. Whereas direct losses can be determined on the basis of relatively safe estimates, the consequential losses are very difficult to determine. In any case, they must be rated far higher than the direct losses caused by faulty feeding during rearing.

The carnivorous fur-bearing animals, which are only at the beginning of domestication, are very sensitive to nutritional deficiencies and experience disturbances, particularly of the fat, vitamin and inorganic metabolism, as in these species some biological, anatomic and physiological peculiarities have to be considered:

1. From the characteristic periodicity of some biological functions of fox and mink, e.g. monooestrous multipara, seasonal moulting or fur ripening results a varying intensity of metabolism and energy requirement during different seasons (Skarman 1952, Stout et al. 1968; Gerber 1972; Szuman 1976).

   The females are subject to high metabolic stress during pregnancy, and as a result there are particular demands on adequate feeding. At the beginning of gravidity the females are likely to be in a reduced feeding condition, as they have fed poorly during rut. The time of pregnancy coincides with Spring moulting. Beside these two factors, which put a load on the organism, the developing embryos, later foetuses, put a further strain on the constitution and the efficiency of the females. In multiparous animals, particularly, the absence of adequate amounts of protein, carbohydrates, vitamins, mineral matter and trace elements previous to and during pregnancy inevitably leads to deficiency syndroms and even to decay of foetuses and/or too low weights at birth, small litters and weak kits. But also overfeeding and fattening of the females, respectively, involve problems like complicated births, weak kits, lack of milk etc. Thus rearing results and losses, respectively, may be significantly influenced even before and during gravidity through the feeding of the females.

2. Likewise nutrition and feeding play an important role for the wellbeing, development and intensive growth of the kits and young animals. After doubling in weight on the fourth day, the birth weight of 8.1 g (3.8 ... 14.5 g; Wenzel 1975) is increased almost tenfold after three weeks at the end of the suckling growth. In this period the mother's milk, containing 31.0 per cent protein, 35.4 per cent fat, 3o.5 per cent carbohydrates and 3.1 per cent ash is the only food which meets all the demands of the kits. The more young animals per females to be satisfied, the more quickly the milk source is exhausted. Therefore, beginning from the third week, additional feed must be offered meeting the requirements of the young animals. After weaning at 35 to 4o days the mink grow more and more intensively and reach 2o per cent of their final weight at one and a half months, 4o per cent at two months, 65 per cent after three months and 8o per cent after four months. Similar weight gains hold for fox whelps.

   Quantity, composition and quality of the feed must ensure the expected daily gain, for the quicker the growth process, the better the individual components of the ration must agree with bodily substances to be built up (Loeschke 1969).

3. The fertility of the fur-bearing animals depends on feeding over the course of the whole year. If the substance losses and the vitamin and mineral matter losses occurring in the female organism during gravidity and nursing period are rectified too late and the young animals get an unbalanced supply of amino acids and vitamins during the period of intensive growth, there will be a negative influence on reproduction and rearing results in the following breeding period (Duby 197o; Gilbert and Baily 197o; Kukla 1972; Scheelje 1973; Åhman 1974; Adams 1976).

4. Based on some anatomic peculiarities listed below certain peculiarities exist concerning digestion:
   - As, in contrast to omnivora and herbivore, the carnivorous fur-bearing animals have fewer teeth used for chewing and a relatively low volume of mouth cavity the food is hardly ground and swallowed at once.

Table 2. Survey of the most relevant metabolic disturbances in fur-

G.D.R. within a period of ten years.

Name of disease	Aetiology	Clinical symptoms age group mainly concernes	Faeces
1. Vitamin B deficiency. - Thiamine deficiency Chastek Paralysis	Frequently found in fox and mink, Vitamin B deficiency with high supply of thiaminase containing fresh water fish (bream, carp)	Particularly in growing mink, 4th to 16th week of life in silver fox	Thin, slimy, often tar-coloured
- Biotin deficiency	Feeding of raw hen's eggs (infertile eggs) produces a biotin deficiency in mink (preferably breeding mink, but also young animals). The egg albumen contains avidin, which makes biotin unavailable for the animal.	Young mink and breeding mink, fox, chinchilla	Diarrhoea with yellow-brownish faeces.
2. Vitamin D deficiency - Disturbance of the Ca-metabolism	Inadequate supply of Ca and P and an imbalance between these two substances, respectively, accompained by too poor supply of Vitamin D produces illness of the growing skeleton. In adult animals decalcification in the bones evident as osteomalacia.	Mainly in growing foxes, less frequently in mink and adult fur-bearing animals.	-
3. Vitamin E deficiency.	Due to increase of the number of fur-bearing animals the feed requirements rose considerably, consequently change from feeding of slaughterhouse products (among others horsemeat) and whole fish (cod - Gadus morrhua) to fish and slaughterhouse offal and animal and vegetable dry feed. Rancid fat and/or high content of unsaturated fatty acids and resulting high peroxide content in the feed are primary inducing factors.	Particularly young animals from 3 to 4 months.	-
- Disturbance of the fat metabolism Fatty liver degeneration Steatitis Yellow fat disease	Induced by rancid fat in the feed and by the absence of sufficiently antioxydant substances, particularly Vitamin E (see above). From oxidation of free unsaturated fatty acids result peroxides. Disturbance of a number of biochemical processes in the organism. Rancidness of feed, occurrence of steatitis after feeding of fat fish, fish oil, horse fat and fat from poultry.	Mink, fox, chinchilla.	Rarely diarrhoea.
- Alimentary fatty degeneration of organs.	Occurs after rich feeding of starch containing and fat feedstuff, leads to considerable fat storage in the tissues.	In autumn in mink, fox; during all seasons in chinchilla.	Thin, slimy, later brownish-black.
4. Nursing disease.	Caused by a great loss of electrolytes (Na, K, Cl) and iron through the milk, in case of insufficient substitution by feed and simultaneous lack of protein and feed.	Lactating females at the end of the nursing period.	Most slimy to tar-coloured.
5. Anaemia in mink induced by fish.	Occurs in case of rich feeding of raw fish. Evidently there is a relation between iron resorption and feeding of fish (Theragra chalcogramma). This fish contains thermolabile trimethylaminoxide, which forms insoluble and therefore non-resorbable iron hydroxide with the iron .	In growing mink.	Often thin later tar-coloured.

bearing animals found by Pelztiergesundheitsdienst "Süd" of the

Course	Pathological anatomy	Therapy	Prophylaxia
Chronical course of the disease, lack of appetite, body weight loss, or stagnation of body weight development, nervous disease symptoms, wide backward bending of the heat is typical	Macroscopic evidence unspecific, carcasses are meagre, acidosis and chronical diarrhoea.	Treatment of the sick animals with Vitamin B1 and B complex, respectively, is successful. Simultaneously the reason of the disease (thiaminase containing feedstuff) must be eliminated. Symptomatic treatment of the diarrhoea by diet. Feeding of raw hen's eggs must be avoided or the eggs must be boiled before feeding. Addition of biotin containing preparations and of feedstuff rich in biotin.	Use of feed yeast appr. 4-5g/animal/day. Thiaminase containing feedstuff must only be fed in small quantities and boiled. Prophylactic injection of Vitamin B complex, if fresh water fish is fed.
Spontaneous as fur and tail biting in fox and mink. With mink kits rusty red colouring of the hair round the eyes, "spectacles". Underfur is whitish-grey, fur thin and sparse, animals get meagre.	Skin thickened, scurfy with degeneration of the hair follicles, loss of hair, greying of fur.		Avidin is inactivated by boiling. Eggs must be boiled before feeding to mink. Adequate supply with biotin containing feedstuff (yeasts, liver, kidneys).
Course is chronical. Young mink show growth disturbances. The gait is unsteady, bow-logged or cowhocked position, curvature of the spine, fur is thin and without gloss, animals are in poor health, often die after several weeks' illness. Surviving females often have birth complications due to the poor skeleton.	Body has stagnated in growth, obvious swelling of the epiphyses of the extremities and ribs, chronical diarrhoea, curvature of the spine.	Rachitis which is not too far advanced can be cured. Parenteral injection of Vitamin D preparation (20-100.000 International Units) according to animal size. Repetition after 8-10 days, beside oral administration (300-400 International Units/kg dry substance). By adequate feeding the Ca - P balance must be optimized. Expose animal to direct sunlight. No use of sick mink for breeding.	Balanced supply of P and Ca. Oral supply of sufficient Vitamin D. Keep the animals in bright sheds, direct exposure to sunlight, application of 3-5 g Edapan (mineral matter mix for fur-bearing animals).
Features of the disease are hardly typical, animals are inactive, do not move, feed poorly, reduced erythrocyte resistance, haemolytic sera.	Mainly big kits die, muscle distrophia, degenerative changes of the fat tissue and of the heart muscle, fat infiltration of the liver, occurrence of haemorrhages under the skin and in the organs.	Treatment with Vitamin E and or sodium selenite.	Requirement in normal feeding 1-2 mg, during pregnancy 4-6 mg Vitamin E day. Use of high-grade feed, if fat fish is fed doubling of the daily Vitamin E requirement, addition of 1 mg sodium selenite per kg feed.
Mostly acute, well-fed animals die suddenly, rarely diarrhoea, disturbance of equilibrium, features of paralysis, high mortality, death of foetuses in pregnant animals, subsequent endometritis, parameters of fat metabolism significantly increased (increase of total lipoids in the liver and of phospholipoids, β-lipoproteides, free fatty acids and of cholesterin in blood plasma).	Well developed mink bodies. Subcutaneous fatty tissue is of typical dirty- greyish-brown to yellow colour, edemic moisture of fatty tissue, carcass has a sharp sour smell, spleen increased, skeleton muscles of yellow-red colour, deposition of a large quantity of lipoids in the liver, degenerative changes of the liver cells.	Ill mink get Vitamin E per os or parenteral 15-20 mg and 30-40 mg Vitamin B15/kg body weight, daily over 2-3 weeks. Rancid fat is removed, correction of the amino acid balance in the ration.	Feed selection must consider the content of oxidizable unsaturated fatty acids, prophylactic application of antioxydants, e.g. Metylenblau, BHT, UMQ (15 mg Vitamin B15 per kg body weight. 2 mg Vitamin E, 3 g Edapan per animal for increasing the Se content in the ration).
Very good feeding condition without appetite, movements are inert, belly wetting in males, death suddenly or after longer illness.	Very good feeding condition, in case of longer illness meagre, liver and kidneys are orange yellow, skeleton muscles yelleowish-red, histologically visible changes in the liver.	Shortening of feed ration, liver therapy, diet, correction of the amino acid balance of feed (methionine, cystine).	Balanced ration of carbohydrates, fat and protein in the feed ration.
Is chronical, animals emaciate, fur bristly, without gloss, anaemic phenomena, death as a consequence of acidosis.	Total emaciation, muscles are atrophically pale, mucous membranes pale, smell of carcass peculiarly stalemetallic.	Treatment by administration of electrolytes (physical NaCl solutions) and vitamins (B complex) besides addition of NaCl to the feed of lactating females (0.5 g/animal/day) and adequate supply of drinking water.	During lactation addition of 0.5 g NaCl/animal/day in the feed. Early weaning of young animals (40th to 45th day with mink, 7th week with fox), part large litters, adequate feed supply in good quality, adequate supply of vitamins.
Reduced appetite, consequently stagnation of body weight, unsatisfactory results of reproduction, occurrence of white underfur due to poorly pigmented wool hair, increased losses, serum iron, hemoglobin, hematocrit and erythrocyte values are reduced.	Carcasses are meagre, moderate development, skeleton muscles are pale red, mostly moist-watery.	"Anaemic fish" must not exceed 25%, if larger quantities must be fed, boiling is necessary, treatment with inorganic and organic iron preparations, application of Vitamin B complex.	Supply of an amount of "anaemic fish" not exceeding 25%, increased supply of slaughterhouse offal and fresh liver, regular supply of iron preparations.

- Due to the anatomic conditions in the stomach of the mink the food is neither softened nor ground (Zhilinskij 1975).
- The length of the intestinal canal in relation to body length is far smaller in mink and fox than with other animal species - in these species it amounts fo a four-fold of the body length (Neseni et al. 1955; Sibbald et al. 1962 - quoted after Pereldik 1974). Due to domestification farm mink underwent a further shortening of the intestinal canal as compared with wild mink (Drescher 1975).
- Shortness and structure of the intestinal canal cause short passage periods of the chyme of about 142 minutes with variations according to the composition of the feed ration between 62 and 24o minutes in mink and 6.5 to 8 hours in foxes (Wenzel 1974).
- The low volume of the colon and absence of the caecum indicate that the intestinal canal of fur-bearing animals is not suited to bacterial digestion. This explains the poor utilization of nutrients contained in vegetable food by carnivorous animals. As there is no digestion of raw fibre either, Vitamin B must always be added to the feed (Löliger 1956; Neseni 1958; Wejda 196o; Helgebostad 1963; Eichel 1966; Krahnert et al. 1969).

Author's translation from Brühl 19,5, 1o-12, 1978.

COMMUNICATION.

M.E.M.

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Objet :

RÉPUBLIQUE FRANÇAISE

MINISTÈRE DE L'AGRICULTURE

Dr. Helge OLSEN
Scientifur
48 H Roskildevej
DK 3400 HILLORØD

Danemark

Jouy-en-Josas, le November 13, 1978

Dear Dr. Olsen,

I hope that it is not too late to inform you of our possibility to participate in the Second International Scientific Congress in Fur Animal Production in April 1980 in Denmark.

Here are our proposals :

1. Dr. Geneviève CHARLET-LERY et al.
- Energetic and nitrogen balance in male mink during the growing phase and during the annual adult life ;
- Technique of feeding pellets to mink.

2. Dr. Lise MARTINET et al.
Hormonal and photoperiodic control of implantation in mink.

3. Dr. Jean ROUGEOT et al.
Hormonal and photoperiodic regulation of spring and autumn molts in mink.

Details on these subjects will be furnished later. With kind regards,

Sincerely yours,

J. ROUGEOT

Dr. Gunnar Jorgensen
Scientifur
48 H Roskildevej
DK-3400 Hilleroed
Denmark

December 21, 1978

Dear Gunnar:

Enclosed is our check to Scientifur in the amount of $250. This will cover our subscription for 1979 and what is in the balance you can consider as our support to your fine journal. We wish you every success in the New Year, and we hope that our support will be of some small assistance in that direction.

Sincerely,

Arthur L. Anderson
Division Manager

ALA:jw

Encl.

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