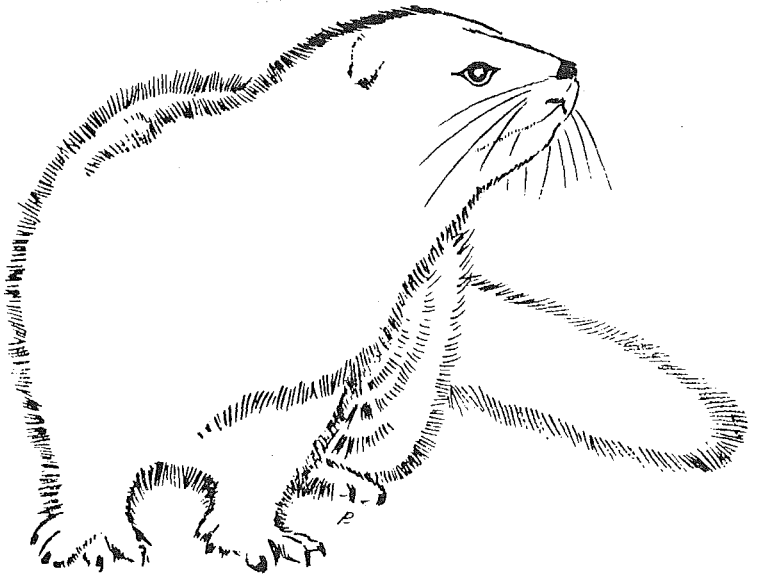
SCIENTIFUR

No. 4, November 1980



SCIENTIFUR
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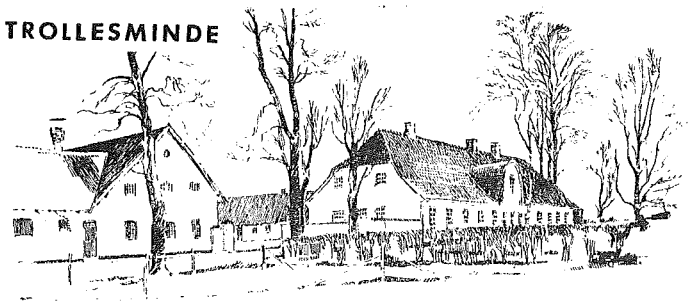
November 1980

7. VETERINARY SCIENCE.



NOTES

SCIENTIFUR

Vol. 4, No. 4, November 198o.

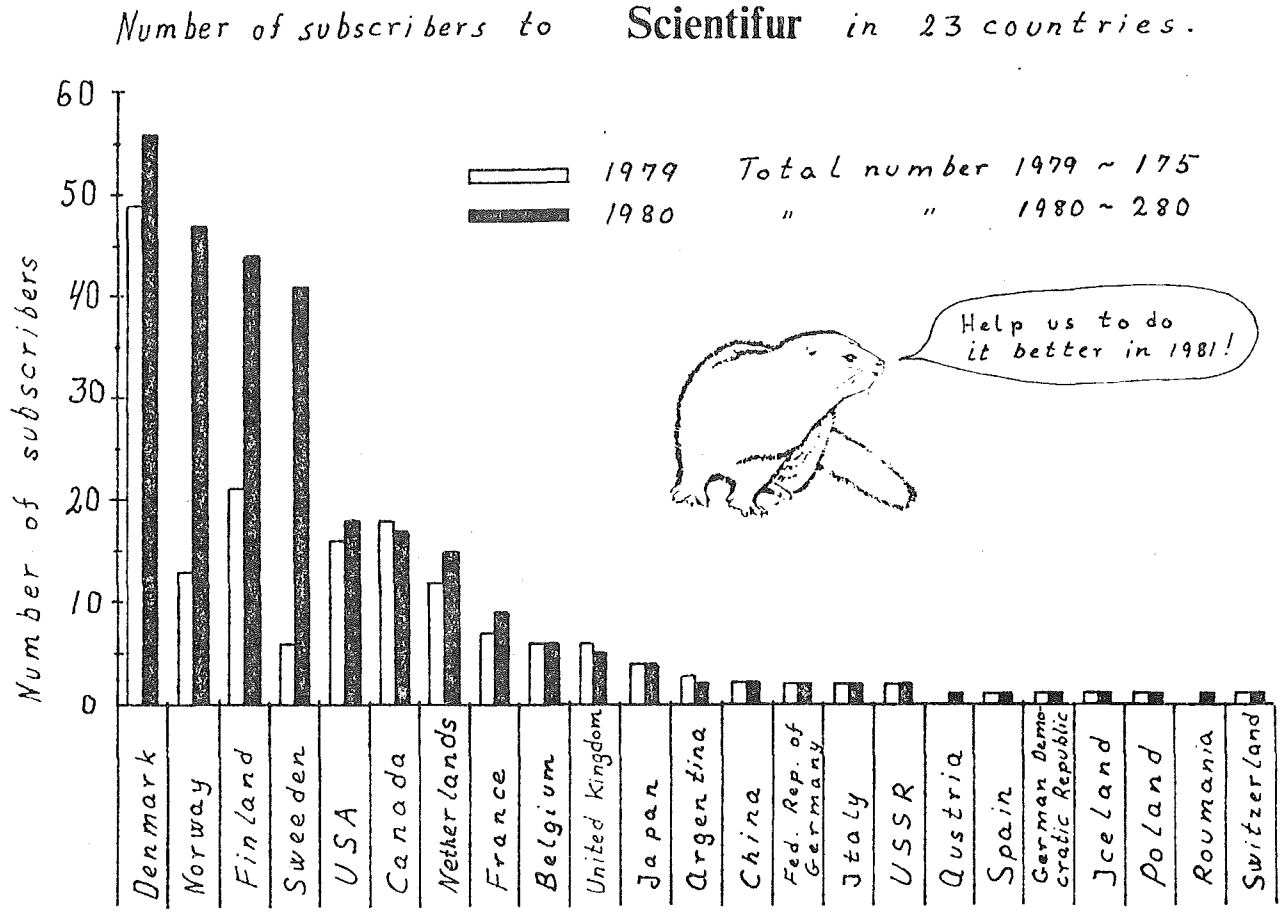
198o was the year in which most countries had to realize that the economic crisis cannot be solved from outside but only through a realistic economic policy and understanding and active efforts by the individual citizen.

198o was also the year with be best economic result of fur production ever recorded. This is not self-initiated, as is the case for the economic crisis. But it is worth noting that a production, the existence of which rests on understanding of and compliance with the most important law, that of consolidation, can exhibit both an increase in production and better economic results in a period of crisis.

198o was the year in which The Second International Scientific Congress on Fur Animal Production could gather almost 15o researchers from 18 different fur-producing countries. This clearly shows that the fur producers consider research and development an integral part of the consolidation within this industry.

Finally, 198o was the year in which number of subscribers to SCIENTIFUR rose from 175 to 28o, i.e. an increase by more than 3o%, thanks to the decision by the Scandinavian Fur Animal Breeders' Associations to take out 4o subscriptions to SCIENTIFUR per country to ensure its continued publication.

The following Figure shows the distribution of subscribers by countries.



The Figure clearly indicates that SCIENTIFUR is known in all countries with a fur production of any consequence. On this occation we do not wish to relate number of subscribers to the fur production in the individual countries, but it is evident that some countries feel a greater need for SCIENTIFUR than others.

We are fully aware that both the knowledge of the existence of SCIENTIFUR as well as language barriers and matters of finance play a role. Developments have shown that SCIENTIFUR is able to give information about most of the findings within the subject of fur animals and that the journal is an important supplement to the fur animal journals produced in the individual countries.

I can say that overlapping with the most common fur animal journals is so slight that SCIENTIFUR is a necessary tool for researchers, advisers and top staff within fur animal production. Against this

background, it would appear feasible for organizations in many countries to see an advantage in SCIENTIFUR being more popularized than is the case today.

Besides reports and abstracts received direct from the authors, reading of Current Contents and various Abstracts and annual computer retrieval of information ensure that most of the research news becomes available. The only problem remaining to be solved is sufficient coverage for research conducted in Russia. We should be grateful if our readers could assist in this matter.

This issue of SCIENTIFUR also contains too much "old" and too little "new" subject matter. Even though we are convinced that much of the "old" is "new" to our readers, SCIENTIFUR is not intended as a journal on archaeology. Our journal must be supertopical, show trends and results in research and production so that SCIENTIFUR is the publication from which to gain knowledge and incentive for the work of tomorrow.

After four years we must face the fact that SCIENTIFUR has not become the journal of debate and information originally intended. BUT WE CAN MAKE IT SO YET - THIS IS UP TO OUR CONTRIBUTORS.

Furthermore the intention also was for SCIENTIFUR to be the forum for discussion og preliminary research results with a view to comments from colleagues who might have something up their sleeve that could put an observation made, but difficult to interpret, into perspective. We know that a researcher's head and desk are full of unsolved problems. Why not try - through SCIENTIFUR - to have some of them solved - free of charge, except for the time it takes to write and "envelop" and a bit of stamp licking. Truly this is the cheapest type of research possible. Owing to constant financial cuts, research institutions must at all times consider how to find the cheapest means for the solution desired. SCIENTIFUR is one of these means.

In SCIENTIFUR Vol. 4, No. 2, an invitation was extended to The

Third International Scientific Congress on Fur Animal Production in Paris in 1984.

A piece of topical news to SCIENTIFUR's readers is that an invitation to the 4th Congress has just been received for 1988. We have received letters from the Canada Mink Breeders' Association and the National Board of Fur Farm Organizations, U.S.A., who have decided on a joint arrangement of The Fourth International Scientific Congress on Fur Animal Production - somewhere in North America.

In the next issue of SCIENTIFUR we shall revert to this invitation, when we know of reactions from the Board of the Scandinavian Association of Agricultural Scientists, Fur Animal Division.

With this news we wish to thank you all for good friendship throughout 1980. Thank you for happy and beneficial hours spent during the Congress last April, thank you for support to international cooperation through subscription to SCIENTIFUR, and thank you for contributions in the form of original reports and abstracts.

LET US BEAR IN MIND THAT INTERNATIONAL COOPERATION AND THE CONTENTS AND FUTURE OF SCIENTIFUR IS WORTHY CAUSES FOR EACH OF US.

Merry Christmas and a Happy and Prosperous New Year to you all.

With kind regards

Gunnar Jørgensen
The editor

PS We also wish to thank The Development Cooperation Bureau, The Royal Veterinary and Agricultural University of Copenhagen for their assistance with translating Notes etc. in this issue of SCIENTIFUR.

TREATMENT OF MINK FOOD MANUFACTURING WASTES.

G. Earl Torgersen, Consulting Engineer, Engineering Associates,
Salt Lake City, Utah, USA.

In an attempt to provide suitable solutions for treatment of wastes it is sometimes necessary to attempt solutions which are somewhat unorthodox but suited to the situation at hand. This paper presents a solution to a particular problem in waste treatment which was peculiarly applicable at the time and place it was applied. It is somewhat doubtful if similar circumstances justifying a similar solution would occur very frequently. However, the method used for the treatment of the wastes and the success derived therefrom warrant a report of the solution.

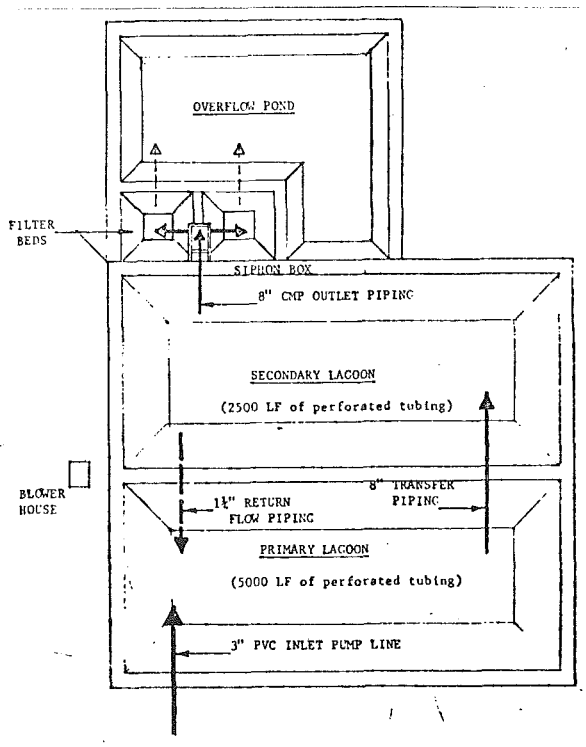


Figure 1 - Waste treatment lagoons - Fur Breeders Agriculture Cooperative.

Treatment of the wastes produced from mink feed production can be effectively accomplished by aerated lagooning. In the instance reported herein, although flow through periods within the lagooning system are about 3o days, BOD reductions are estimated to be as high as 9o per cent from inlet to outlet throughout the year with much of the final BOD attributable to algae in the effluent.

A combination of favorable circumstances resulted in a very economical installation which requires no experienced help to operate or maintain. For wastes of this type aerated lagooning can be a very satisfactory solution, provided sufficient land for the system is available. The local regulatory authority will permit the operation, providing the requirements of the receiving stream can be met. Inclusion of algae recovery from the final effluent would produce a product which would meet almost any reasonable stream standard.

Proceedings of the 23rd Industrial Waste Conference, May 7, 8, and 9, 1968. Engineering Extention Series No 132, 497-5o6. Purdue University, Lafayette, Indiana.
2 tables, 1 fig.

Authors introduction and conclusion.

● THE HISTOLOGY OF THE SCENT GLANDS OF THE STRIPED SKUNK, MEPHITIS MEPHITIS.

L.F. Morgans, G.A. Heidt, Dept. of Biology, University of Arkansas at Little Rock, Little Rock, Arkansas.

The scent glands of the striped skunk exist as a pair of organs that are situated laterally to the distal end of the rectal region. Each gland consisted of a small titlike area which can voluntarily be everted into the lumen of the anus and a large saclike fundic area which contained the glandular tissue. Histologically, the scent glands were divided into three areas - a mucosa, muscularis, and an adventitia or serosa. The mucosa consisted of a rather thick cornified stratified squamous epithelium and a lamina propria that contained dense connective tissue. The muscularis was very thick. It comprised about three-fourths of the total thickness of the organ. All of the muscle fibers were striated and they ran in all directions, i.e., longitudinally, circularly, and obliquely. However, the fibers tended to be arranged in fascicles which were separated from one another by aerolar connective tissue. The glandular tissue was all concentrated in the form of two or three large lobes on one side

of the organ within the muscularis. The glandular tissue was of the compound tobuloalveolar variety. Some portions of the organ were covered with a serosa while other portions were covered with an adventitia. The serosa consisted of dense connective tissue and a simple squamous or stratified squamous mesothelium. The adventitia contained dense connective tissue which blended in with the surrounding facia.

Note in Anatomical Record, 1975, Vol. 181, No.2, 43o.

● DIFFERENCES IN REGENERATION OF THE SKIN IN DIFFERENT SPECIES OF MAMMALS.

E.A. Efimov, Laboratory of Growth and Development, Inst. of Human Morphology, Academy of Medical Sciences of the USSR, Moscow.

The healing of full-thickness skin wounds measuring 1.2 cm^2 was studied in mink and sable. In both species of animals the skin defect closed mainly through contraction of the wound. Hairs and sebaceous glands were found in the small area of regenerating skin formed in the center of the primary defect. It is postulated that these hairs developed from bulbs of "old" hairs which migrated into the regenerating zone together with the lower layers of the dermis adjacent to the wound.

Translated from Byulleten' Eksperimental'noi Biologii i Meditsiny, Vol. 81, No.6, pp 742-745, June 1976.
3 figs., 9 references.

Authors abstract.

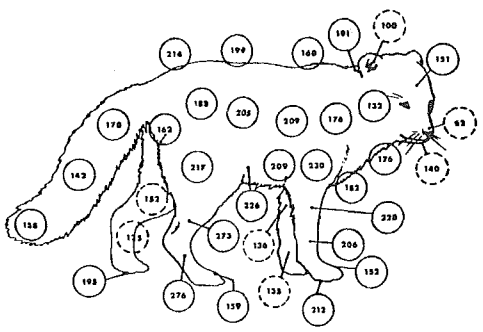
PHOTOPERIOD AND FUR LENGTHS IN THE ARCTIC FOX (ALOPEX LAGOPUS L.).

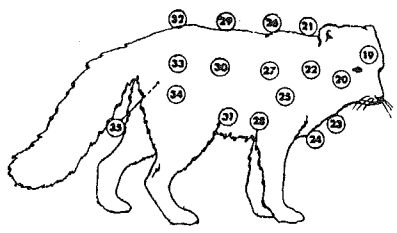
L.S. Underwood, Patricia Reynolds, University of Alaska, Arctic Environmental Information and Data Center, Anchorage, Alaska.

Pelage is seasonally dimorphic in the Arctic fox. During the winter, fur lengths for this species are nearly double similar values taken during the summer season. Considerable site-specific differences in fur length are noted. In general, body sites which are exposed to the environment when an Arctic fox lies in a curled position show greater fur lengths in all seasons and greater seasonal variations than body sites that are more protected during rest. Well-furred sites may tend to conserve heat during periods of inactivity, and scantily furred sites may tend to dissipate heat during periods of exercise. The growth of winter fur may compensate for the severe cold of the arctic winter. Changes in fur lengths indicate a definite pattern in spite of individual variations. During the fall months, fur lengths seem to lag behind an increasing body-to-ambient temperature gradient. Both body-to-ambient temperature gradients and fur lengths peak during December through February. From March through June, gradual environmental warming is accompanied by a decrease in average fur lengths. Thus, there appears to be a remarkable parallel between the body-to-ambient temperature gradient and the fur lengths. The growth of fur in the Arctic fox parallels annual changes in ambient temperature and photoperiod.

Int. J. Biometeor, 1980, Vol. 24, No.1, 39-48.
1 table, 4 figs., 18 references.

Authors abstract.





19 Forehead
20 Cheek
21 Dorsal neck
22 Lateral neck
23 Ventral neck
24 Sternum
25 Shoulder
26 Dorsal chest
27 Lateral chest
28 Ventral chest
29 Dorsal back
30 Lateral abdomen
31 Ventral abdomen
32 Dorsal hip
33 Lateral hip
34 Groin

Fig. 3. Winter fur depths of the Arctic fox. Percent of August. Mean: all sites — 178%, extremities — 168%, body — 190%. O statistically significant (P = 0.01); ○= ns.

CYTOLOGICAL AND EXPERIMENTAL STUDIES ON THE PARS DISTALIS OF THE MINK MUSTELA VISON, A LIGHT MICROSCOPIC STUDY.

Birgitta Weman, Dept. of Zoology, University of Stockholm, Box 6801, Stockholm, Sweden.

The pars distalis of adult minks were examined by light microscopy. Seasonal variations in cytology and the effect of photostimulation and various drugs were studied.

Six types of glandular cells were identified by their structural and staining qualities. To each has been tentatively assigned an endocrine function.

Problems in the interpretation of experiments involving administration of drugs are discussed. Discussion is also devoted to the difficulties in demonstrating the mink prolactin cells.

Pars Distalis of the Mink

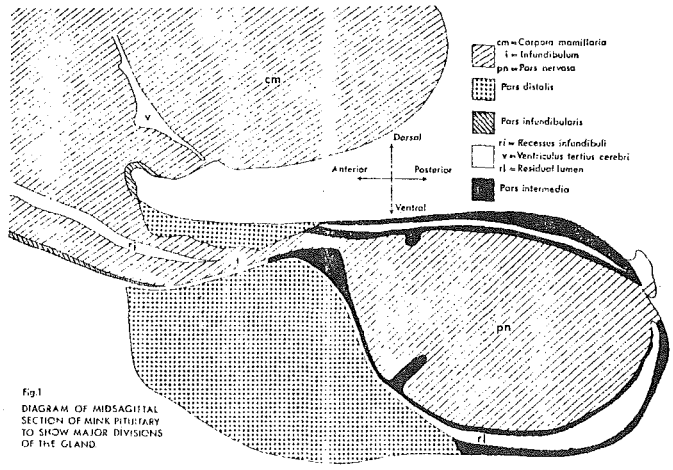


Fig.1
DIAGRAM OF MIDSAGITTAL SECTION OF MINK PITUITARY TO SHOW MAJOR DIVISIONS OF THE GLAND

Acta Zoologica 1970, 51, 183-202.
6 tables, 14 figs., 69 references.

Authors abstract.

THE PARS INTERMEDIA OF THE MINK, MUSTELA VISON. FLUORESCENCE, LIGHT AND ELECTRON MICROSCOPICAL STUDIES.

B. Weman, A. Nobin, Dept. of Zoology, University of Stockholm, Box 6801, S-113 86 Stockholm 6, Sweden.

The pars intermedia of intact and experimental female minks has been studied by light, electron and fluorescence microscopy. The general structure of the mink intermediate lobe is described. Two main cell types are recognized. One, termed glandular cell, predominates in number and is characterized by the presence of electron-dense granules about 200 nm in diameter and numerous large vesicles up to 300 nm in diameter. The other, termed stellate cell, is devoid of cytoplasmic vesicles and granules and possesses microfilaments, junctional complexes and elongated processes inserted between the glandular cells. Different treatments (photostimulation and administration of hypertonic saline and metopirone) induced morphological reactions in the glandular cells. The significance of these changes and the possibility of a functional relation between the pars intermedia and ACTH secretion are discussed.

Numerous nerve fibres and axon terminals containing electron-dense granules (60-120 nm) and electron-lucent vesciles (30-40 nm) are observed throughout the pars intermedia.

With the histochemical fluorescence method of Falck-Hillarp a rich system of delicate fluorscent varicose fibres, sometimes provided with irregular swellings or droplets, is observed in the pars intermedia and also in the pars nervosa. Microspectrofluorometrically these fibres exhibit the spectral characteristics of catecholamines. All the celles of the pars intermedia and a large number of cells in the pars distalis show a yellowish weak fluorescence, which becomes much stronger after combined formaldehyde-ozone treatment. This cellular fluorophore shows the same microspectrofluorometric characteristics as does the fluorophores of tryptamine and of certain peptides with NH_2-terminal tryptophan.
Z. Zellforsch. 143, 313-327, 1973.
8 figs., 65 references. Authors summary.

FINE STRUCTURE OF THE PARS DISTALIS OF THE PITUITARY GLAND IN THE FEMALE MINK, MUSTELA VISON.

Birgitta Weman, Dept. of Zoology, University of Stockholm,
Box 6801, S-113 86 Stockholm, Sweden.

Pituitary glands of intact and experimental adult females of mink, Mustela vison, were examined by electron microscopy. Conventional methods involving removal of endocrine glands (ovaries and adrenals), administration of radioactive isotope, ^{131}I, blocking agents (thiouracil and metopirone) and hormones (thyroxine, hydrocortisone, thyrotropin and luteinizing hormone releasing hormones) were employed. Five categories of granular cells were distinguished both by their ultrastructural characteristics and qualitative changes throughout the year and following different treatments. The cell types are described and their functions discussed. From conventional electron microscopical studies it proved difficult to draw any satisfactory conclusions about the gonadotropic cells. Further investigation by means of immunocytochemistry and radioimmunoassay techniques is required to determine, whether the presumptive gonadotropic cell type produces both FSH and ICSH or only one of these hormones.

Morphologically two types of agranular cells were identified. Their morphological inter-relationship and function are discussed briefly.

Acta Zoologica, 55, 119-136, 1974.
9 figs., 57 references.

Authors abstract.

ATTEMPT AT OBJECTIVE EVALUATION OF UNDERHAIR COLOUR IN BLUE FOX (ALOPEX LAGOPUS L.).

(Próba obiektywnej oceny barwy podszycia u lisa polarnego (Alopex lagopus L.).

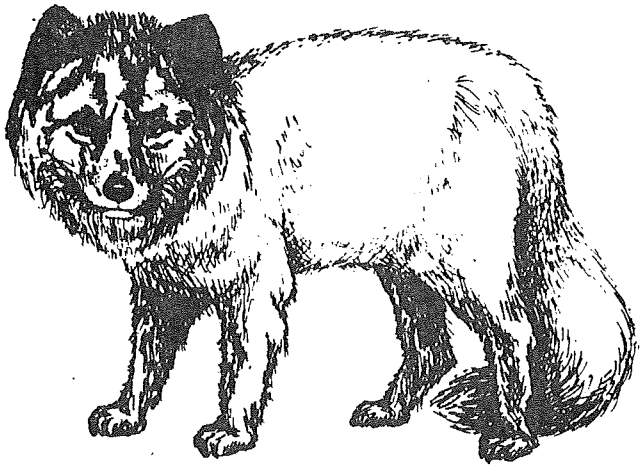
Ryszard Cholewa, Jerzy Gedymin, Z Instytutu Hodowli i Technologii Produkcji Zwierzecej, Poland.

The colour of the underhair in blue fox an important qualitative feature of the coat, is of low intensity with differentiated shades which are difficult to evaluate visually. The authors evaluated 59 hair samples using the photocolorimeter "Momcolor" of three impulses. These measurements were compared with visual evaluation by 2 sorters who determined colour intensity and shade.

From colorimetric measurements the following values of colour parameters were obtained: hue 2 d 56o-613 µm saturation Pe o.ol-o.lo, light Y 25.6-4o.9%. The compatibility of qualitative evaluations using colorimeter with visual estimations appea - red to be lower than in the case of quantitative features. The compatibility of results from 3 replications was higher in colorimetric than in visual evaluations, which indicated better objectivity of colorimetric evaluation. The precision of evaluation appeared to be approximately equal for both methods.

Roczniki Akademii Rolniczej w Poznaniu, LXXIV, 1974.
In Polish with subtitles and summaries in English and Russian.

Authors summary.



G- AND C-BANDING PATTERNS OF CHROMOSOMES IN THE ITATSI OR JAPANESE MINK MUSTELA ITATSI (CARNIVORA, MUSTELIDAE).

A.S. Graphodatsky, Yu. G. Ternovskaya, D.V. Ternovsky, G.A. Voronov, V.G. Voronov, Inst. of Cytoloty and Genetics and Biological Institute, Siberian Branch of the USSR Academy of Sciences, Novosibirsk.

The chromosomes of the itatsi were studied by G- and C-banding techniques and compared with those of previously studied species of the Mustelidae. A comparison of chromosomes of M. itatsi (2n =38) and M. sibirica (2n = 38) has shown that the itatsi has 4 additional totally heterochromatic arms, 1 additional heterochromatic telomere band and an additional heterochromatic region of Y-chromosome.

2 figs., 15 references.
In Russian with summary in English.

Authors summary.

MONO- AND POLYMORPHOUS LOCI OF BLOOD PROTEINS IN MUSTELA VISON SCHR.

L.M. Romanov, T.G. Titok, *)

*) the address is not stated. Copy of reprint can be obtained by Scientifur.

Heterogeneity of haemoglobin, albumin, transferrin, esterase, alkaline and acidic phosphatases, haptoglobin, post-albumin, ceruloplasmin, carboanhydrase was studied in 1501 standard and colour minks by means of starch gel electrophoresis. Only the last three proteins of the enumerated ones have hereditary variations. Frequencies of the "main" allels of these systems are

not lower than o.9 and the average heterozygosis is o.o23.

4 tables, 18 references.
In Russian with English summary.

Authors summary.

● IDENTIFICATION OF FIVE SERUM ALLOTYPES OF α_2-LIPOPROTEIN ESTERASES IN AMERICAN MINKS (MUSTELA VISON).

D.K. Belyaev, O.K. Baranov, M.A. Savina, N.A. Yurishina, N.V. Titenko, V.I. Evsikov, Institute of Cytology and Genetics, Academy of Sciences of the USSR, Siberian Division, Novosibirsk.

By means of isoimmunisation with whole serum, to which the complete Freund's adjuvant was added, 2 dispecific and 4 monospecific alloantisera were obtained. Using these antisera in the sera of mink the following allotypes: Lpm-1, Lpm-2, Lpm-3, Lpm-4 and Lpm-5 were identified by means of immunodiffusion. The molecules belonging to any of the five allotypes are identified as α_2-lipoproteins with esterase activity. The data obtained as a result of allotyping of 287 minks suggest that Lpm is under the genetic control, similar to the control which has been established for allotypes of low lipoproteins in rabbits and pigs.

Genetika, 1974, Vol. 1o, no. 1, 62-7o.
2 tables, 4 figs., 25 references.
In Russian with summary in English.

Authors summary.

STUDIES ON IMMUNOGLOBULINS OF MINK: DEFINITION OF IgG, IgA AND IgM.

J.E. Coe, W.J. Hadlow, United States Dept.of Health, Education, and Welfare, Public Health Service, National Inst. of Health, Natl. Inst. of Allery and Infectious Diseases, Rocky Mountain Laboratory, Hamilton, Montana, 5984o.

Three major Ig classes, IgG, IgA, and IgM were characterized in mink serum. Mink IgM was a β globulin and was changed from 19S to about 6 to 7S after mild reduction and alkylation. IgA was found in serum, urine and saliva, although the greatest concentration of IgA was found in intestinal contents. The IgA's in various fluids appeared antigenically identical, migrated as β proteins and sedimented as 12 to 13S molecules. Only serum IgA, however, was mainly 7S after mild reduction and alkylation.

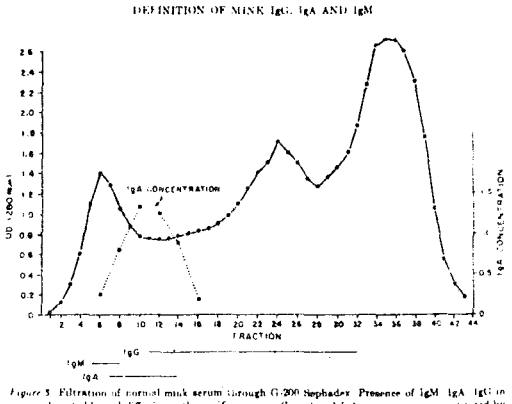


Figure 5 Filtration of normal mink serum through G-200 Sephadex. Presence of IgM, IgA, IgG in fractions detected by gel diffusion with specific antisera (*lower*) and IgA concentration quantitated by radial diffusion. IgM was detected in first protein (OD 280 nm) peak. IgA was found between first and second (IgG) peaks.

The Journal of Immunology, Vol. 1o8, No.2, February 1972.
1o figs., 2o references.

Authors abstract.

● ONTOGENY OF MINK IgG, IgA, and IgM (4oo39).

J.E. Coe, R.E. Race, Rocky Mountain Laboratory, Hamilton, Montana 5984o.

Serum levels and (^{14}C) tissue culture synthesis of IgG, IgA and IgM were determined in pre- and postnatal normal mink. Small amounts of IgG were found in serum from fetal and neonatal mink prior to suckling. This could represent maternal Ig (transplacental) or could be autologous Ig as IgG synthesis was found in day old kit spleen and lymph node tissue. The suckling kit achieved adult levels of IgG (7-1o mg/ml) 8 days after birth althouth IgG then decreased (before weaning) to 1-2 mg/ml during the fifth week of life. Generous amounts (mean 2.9 mg/ml) of IgG were found in mink milk throughout the nursing period. Small amounts of IgA (mean o.17 mg/ml) were also found in mink milk, although IgA was not detectable in kit serum until 39 days of age and IgA synthesis in (^{14}C) tissue culture was not found in tissues from kits less than 75 days of age. IgM was not detected in milk, although (^{14}C) tissue culture synthesis of IgM was consistently found 1-2 days postpartum and serum levels gradually increased during neonatal development.

Soc. for Expt. Biology and Medicine
157, 289-292, 1978.
1 fig., 1 table, 14 references.
Authors summary.

DISTRIBUTION OF Lpm-ALLOTYPIC DETERMINANTS AMONG MOLECULES OF MINK SERUM α_2-LIPOPROTEINS.

O.K. Baranov, Academy of Sciences of the USSR, Siberian Branch, Institute of Cytology and Genetics, Novosibirsk, USSR.

The analysis of sera obtained from minks of various genotypes by double diffusion in gel demonstrated that each Lpm-allotype is present on different molecules. There were no molecules carrying bogh allotypic specificities, with the exception of Lpm 2 and Lpm 5 in minks possessing gene $Lpm^{2,4,5}$. The results do not permit one to rule out the possible existence of allelic exclusion at the molecular level. The distribution pattern of Lpm-allotypic specificities among molecules seems to indicate that each Lpm-allotype is under the control of a single structural gene and, consequently, the allogroups, which are inherited as monogenic characters, are determined by the respective number of closely linked genes.

Immunochemistry, 1976, Vol. 13, 361-365.
1 table, 2 figs, 19 references.

Authors abstract.

COMPARISON OF POLISH AND NORWEGIAN TYPES OF SHADOW BLUE FOX.
(Porównanie Polskiego i Norweskiego Typu Odmiany Cienistej (Shadow) Lisa Polarnego (Alopex lagopus L.).

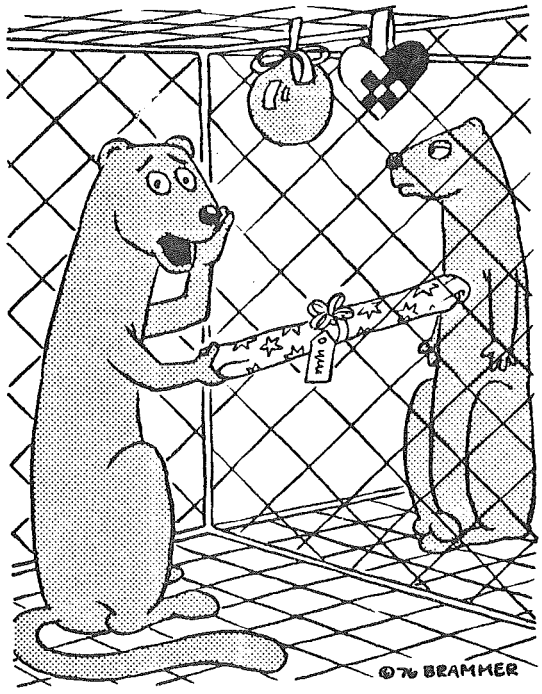
R. Cholewa, J. Gedymin, Z. Instytutu Hodowli i Technologii Produkcji Zwierzecej, Poland.

The new variety Shadow Blue Fox differs much depending on the origine: from Poland or from Norway. The authors examined and compared the length and height of overhair, length of coloured segments in them and their distribution on the trunk, and investigated colometricaly the colour of underhair in 1o foxes of Norwegian type and in 1o foxes of Polish type.

In the Norwegian foxes the coloured hair were more dense and occurred on the whole trunk, while in Polish ones they were only on approximately 55% of the trunk surface. The overhair were slightly shorter in Norwegian type. The colour of underhair was similar in both types.

Roczniki Akademii Rolniczej w Poznaniu - LXXIV (1974).
2 tables, 3 references.
In Polish with subtitles and summaries in English and Russian.

Authors summary.



This year I hope it's a
subscription to SCIENTIFUR!

CORRELATION BETWEEN NUTRITIONAL STATE, BREEDING CONDITION AND REPRODUCTION PERFORMANCE OF FEMALE MINK.

Ulf D. Wenzel, W. Schicketanz, Bezirksinstitut für Veterinärwesen, Abt. Pelztiere, 701 Leipzig, Goldschmidtstr. 21, GDR.

1. Tests

Four test groups were formed in order to ascertain correlations between the nutritional state, breeding condition and the reproduction results of female mink.

Group 1: Females with maximum body mass.
Groups 2, 3, and 4: Females with reduced body mass.

The females of group 1 were fed optimum food rations. The females of groups 2, 3, and 4 were fed a diet with reduced energy content starting early in October. The reduction concerned mainly the proportion of fat and carbohydrates.

This feeding programme was aimed at providing us by the beginning of rut with test groups with an average body mass identical with the body mass at the onset of the cold season.

The objective of the diet was to prevent test groups 2, 3, and 4 from putting on physiological pads of fat and to reduce their body mass by 5 to 10 per cent as compared with the starting time of the experiment. The change of body mass of the four test groups may be seen in the diagram and in table 1.

Table 1

Relation of the body mass (KM) of the test groups to group 1 on March 1st

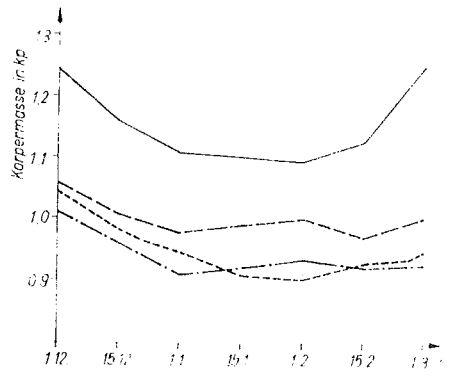
Group 1 = 100%; group 2 = 80.0%; group 3 = 75.6%; group 4 = 74.0%.

Group	Average KM on Dec. 1st in kp	KM in per cent	Average KM on March 1st in kp	KM in per cent
1	1.235	100	1.250	101.2
2	1.065	100	1.000	93.8
3	1.030	100	0.945	91.7

(Table 1 cont.)

4	1.025	100	0.925	90.2

Diagram: Change of body mass during the period between December 1st and March 1st.
In the course of rut relations between the body mass of the females and their mating behaviour became obvious.



2. Discussion

As may be gathered from literature, the authors and probably all breeders agree on the fact that mink has to be in the so-called breeding condition by the beginning of rut.

This condition must be achieved by adequate reduction in food or a reducing diet.

There is no agreement on the question when to start reduced feeding.

Wild living mink is forced to produce a physiological pad of fat in autumn, when the food supply is still ample, in order to survive the winter. The question arises whether this peculiarity caused by instinct should also be supported in farm mink.

The selection of the breeding stock starts long before the pelting period. Evaluation of the studbook and continuous observation of the animals permit early preselection.

By September/October mink selected for breeding should be in the feeding condition desired by the beginning of rut.

Mink intended for pelting, however, must be fed more substantially in order to produce optimum fur length and fur

size. There is a close correlation between body weight, body length and fur length.

According to UDRIS (1964) body length increases by 0.5 cm in males and 0.9 cm in females on the average, when the live weight increases by 100 g. Fur length increases by 1.2 cm on males and by 1.6 cm on females. Fur size increases twice as quickly as body length.

Table 2

Results in the course of rut

The reproduction result of the females seems to be directly dependent on body mass and mating behaviour.

Group	Number of females	twice mated number	in %	once mated number	in %	not mated number	in %
1	35	17	48,57	12	34.28	6	17.14
2	25	15	60.00	8	32.00	2	8.00
3	28	20	71.42	6	21.42	2	7.14
4	32	25	78.12	7	21.87	-	-

3. Conclusions

Our test results are not claimed to be of absolute validity, as the number of test animals was obviously too small. As is well-known, the annual matings have varying results. Litter sizes differ more or less. There are various reasons for this. Let us only mention the complex influences on the condition of the mink, ranging from the diet to influences of the surrounding climate, e.g. environmental temperature and effective amount of daylight.

The test results, however, show clear trends:

Females with unreduced body mass by the time of rut as compared with the months of November/December had absolutely the highest feed consumption during that time, but apart from a number of problems at mating they had the lowest reproduction results.

Females with a body mass reduced by 20 to 25 per cent as compared with the animals fed substantially brought about ~~about~~ considerable food savings and were mated with fewer

complications - which shows that mating may be facilitated without hormone injections - and they produced considerably larger litters.

In this connection we would like to mention Finnish studies (1976) concerning the number of kits per female and the arising feed cost per fur.

Tables 3 and 4

Reproduction results

Group	Females with litter number	in %	Litter live number	in %	Litter dead number	in %	Barren females number	in %
1	20	68.95	18	62.06	2	6.89	9	31.03
2	19	82.60	17	73.91	2	8.69	4	17.39
3	21	80.76	20	76.92	1	3.84	5	19.23
4	28	87.49	25	78.12	3	9.37	4	12.50

Group	Kits born number	in %	Kits born live number	in %	Born dead number	in %	Kits per mated female/with litter	
1	83	100	71	85.54	12	14.46	2.37	4.15
2	94	100	71	75.53	23	24.47	3.76	4.94
3	123	100	98	79.67	25	20.33	4.39	5.85
4	164	100	137	83.53	27	16.47	5.12	5.85

Table 5

Which effects has the number of kits per female on feeding cost?

Reproduction result per mated female	Feeding cost per fur produced
4.0	96
3.9	96
3.8	97
3.7	98
3.6	99
3.5	100
3.4	101

(Table 5 cont.)

3.3	102
3.2	103
3.1	104
3.0	105

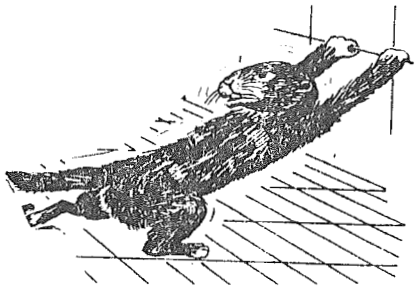
In table 5 the feeding cost for an average quantity of 3.5 kits per mated female was equated with 100. Consequently, 0.5 kits more or less cause 4 to 5 per cent higher or lower feeding cost per fur produced.

The above statements underline that in mink breeding, like in other fields, we must make use of reserves, i.e. measures directed to breeding and feeding techniques should help to make the most effective use of the limited food supply.

4. Summary

According to several sources in literature mink is to be put into breeding condition in January/February by a reduction in diet. A reducing diet which starts too late, however, has very probably a negative effect on the reproduction result.

It has been found that the body mass of the females between early February and the beginning of rut does not seem to have any influence on the birth weight of the kits. Our studies showed that females which had the same body mass at the time of rut as in November / December had the lowest reproduction results. Females with a body mass reduced by about 20 to 25 per cent as compared with the animals fed substantially were more easily mated and produced considerably larger litters. The authors advised to prevent the formation of unnecessary pads of fat on breeding animals, which would, anyway, have to be removed by the time of rut, by an adequate diet. Apart from effective feed savings mating is facilitated and the reproduction result is increased.



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Sehr geehrter Herr Jørgensen!

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In der Anlage übersenden wir Ihnen den Beitrag, wie gewünscht, in englischer Sprache, mit der Bitte um Nennung unserer Zeitschrift bei der Veröffentlichung.

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THE FINE STRUCTURE OF THE LUTEIN CELLS IN THE MINK (MUSTELA VISON) WITH SPECIAL REFERENCE TO THE SECRETORY ACTIVITY DURING PREGNANCY.

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The ultrastructure of the lutein cells in the mink throughout pregnancy and the regression period post partum is described. To correlate the fine structure with the changes in the peripheral plasma progesterone levels, the concentrations of progesterone were measured by a rapid competitive protein-binding assay.

Even during the delay period (e.g. as long the plasma progesterone levels remain at the basal level, <8 ng/ml), the lutein cells in the mink exhibit structural criteria of functional activity. However, the increase in progesterone secretion is accompanied by some morphological transformations, characterized by the presence of more and more small dense homogenous bodies in the cytoplasm, which become irregular and scalloped during the stage with maximum release of progesterone. At this stage the agranular endoplasmic reticulum is often cisternal or visicular.

During the decline of the progesterone levels, typical and moderate electron-dense lipid droplets are found increasingly more within the lutein cells. The expanded agranular ER is now more sparse, while the granular ER becomes more pronounced, often forming parallel arrays. During this phase the mitochondria become elongated, dumb-bell, or cup shaped. After parturition the corpora lutea consist of cells in various stages of degeneration. At day 14 post partum only a few lutein cells are still identifiable.

Evidently the observed morphological changes take place in the lutein cells during the life span of corpora lutea. This feature lends further support to the concept that the mink lutein cells are steroid-producing celles and furthermore, that the corpora lutea may be the main sites of gestagen production during pregnancy.

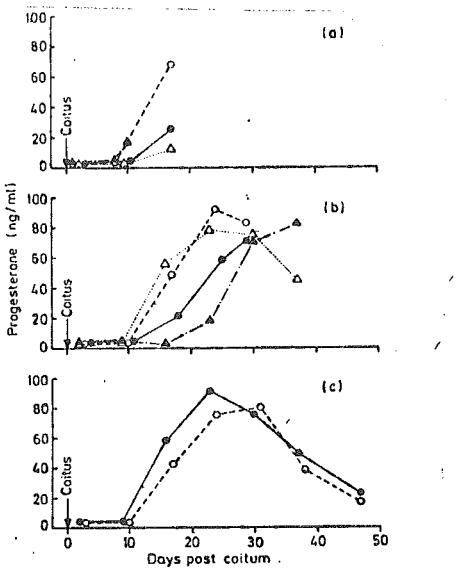


Fig. 1a—c. Plasma progesterone concentrations in 10 pregnant female mink after coitus to the day of killing. Note that there is considerable variation in the length of the delay period *post coitum*, i.e. as long as the plasma progesterone concentrations remained at the basal level, e.g. <8 ng/ml. The last point on the progesterone profiles represents the progesterone values at the day of killing

Z. Zellforsch. 138, 523-544, 1973.
27 figs., 43 references.

Authors summary.

● THE POSITION OF AMERICAN MINK EMBRYOS IN THE UTERINE CAVITY AFTER IMPLANTATION.

ПОЛОЖЕНИЕ ЗАРОДЫШЕЙ АМЕРИКАНСКОЙ НОРКИ В ПЛОДНОЙ КАМЕРЕ НА РАЗНЫХ СТАДИЯХ РАЗВИТИЯ

Лаборатория разведения пушных зверей (зав.— канд. биол. наук Г. В. Соколов) Всесоюзного научно-исследовательского института охотничьего хозяйства и звероводства им. проф. Б. М. Житкова, Киров

V.M. Kolpovski, Laboratory of Breeding of Fur-Bearing Animals, The All-Union Research Institute of Hunting and Fur-Farming, Kirov, USSR.

The special position of American mink embryos is characterized by regular changes and is associated with the development and formation of provisory embryonic organs and the uterus. After the implantation the longitudinal axis of the ambryo's body lies perpendicularly towards the long axis of the uterus horn. From the end of the 22nd day till birth the embryo moves along the antimesometral side of the fetal chamber by rotation counter clockwise relative to the point of attachment of the alantois stalk. On the 2oth day prior to delivery the embryo's body bent

as a coil takes a vertical position, its fore-part is disposed in the yolk sac cavity, and the hinder part is in the exocoelom. During 17 days before birth the embryo "rolls out" from the yolk sac cavity and occupies the low position in the longitudinal posture of the body. During the following 6 days the prefetus moves towards the opposite side wall of the fetal chamber, takes the upper position and keeps a longitudinal position till the end of the embryonic life.

Arkhiv Anatomii Gistologii Embiologii, Vol. 71, 1o, 46-51, 1976.
4 figs., 11 references.
In Russian with subtitles and summary in English.

Authors summary.

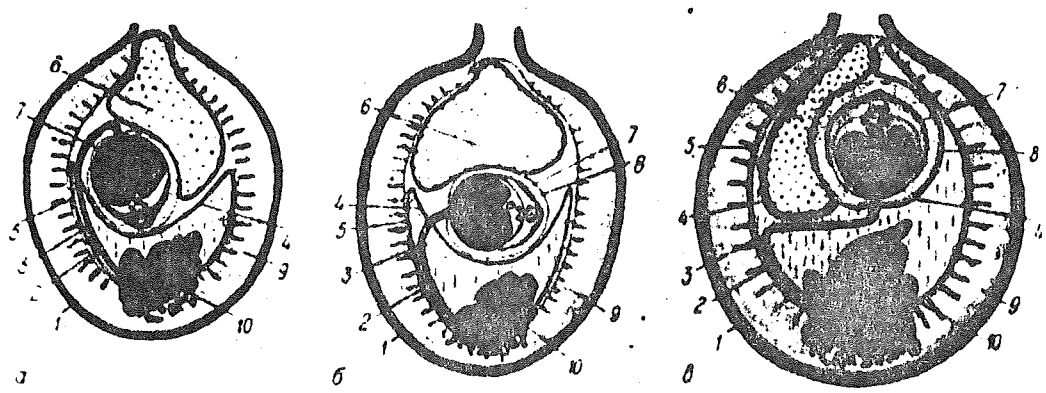
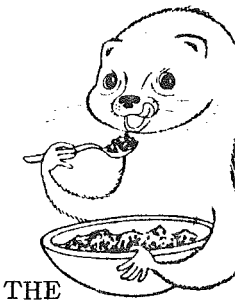


Рис. 4. Изменение ориентации тела зародышей американской норки в предплодном периоде. Поперечное сечение плодной камеры и зародыша.

Возраст: *а* — 15 суток, *б* — 14—12 суток, *в* — 11 суток до родов. *1* — серозно-мышечный слой; *2* — хорион; *3* — пупочный канатик; *4* — средостенная часть аллантоиса; *5* — пристеночная часть аллантоиса; *6* — желточный мешок; *7* — зародыш; *8* — амнион; *9* — эндометрий; *10* — «гематома». Штриховка — как на рис. 3.

Fig. 4. Change in orientation of the body of an embryo of the American mink in prefetal period. Cross section of the fetal chamber and embryo.

Age: *a* — 15 days before birth; *б* — 14—12 days before birth; *в* — 11 days before birth. *1* — serous-muscular layer; *2* — chorion; *3* — umbilical cord; *4* — mediastinal part of the allantois; *5* — parietal part of the allantois; *6* — yolk sac; *7* — embryo; *8* — amnion; *9* — endometrium; *10* — hematoma. I—V — as in fig. 3.



Original Report.

THE FINNISH SINGLE CELL PRODUCTS PEKILO AND SILVA IN THE FEEDING OF FUR BEARING ANIMALS.

Tuomo Kiiskinen, The Finnish Agric. Research Centre, SF-31600 Jokioinen, Finland,

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Pekilo and Silva are the SCP-products of Finnish cellulose industry. Pekilo is produced by means of cultivating mycelia-forming fungi (Paecilomyces varioti) in the sulphite spent liquor. Silva is produced respectively by cultivating yeast (Candita utilis). The first feeding experiments on Pekilo in 1971 were not successful with mink kits (Kiiskinen & Mäkelä 1975). The pilot plant product proved to be toxic for mink kits inducing reduced weight gain and drasticly increased mortality. When the production of Pekilo and Silva started in 1974-75 possible nutritional and toxic effects of these products mainly in mink production should be clarified.

Material and methods

Preliminary experiment on Pekilo was performed 1974 with mink kits (standard). The groups were small (12 ♂♂, 12 ♀♀) and only growth rate was measured. The levels of Pekilo were 15 and 30 % in dry matter (table 1). The experiment was carried out from the beginning of July to the end of October. In July 1975 the experiment started with a level of 20 % SCP (Pekilo and Silva) in dry matter. The size of the group was 80 dawn pastel kits (40 ♂♂, 40 ♀♀). The male kits were pelted in the end of November and their fur quality was judge The females were used for breeding and the experiment was continued until the third generation was 1,5 months old. The level of SCP was decreased during nursing (May-June) to 9 % and at other times to 15 % in dm. SCP replaced fish meal and fish racks in the rations. Blood samples were taken for Hb and serum analysis (total protein, urea, uric acid). Some obductions were also done. The digestibility of both

SCP-products was determined with mink and that of Pekilo also with raccoon dog (Nyctereutes procyonoides). The difference method with total collection of feaces was used. The number of animals was 8 male minks and 6 raccoon dogs in a group.

Results and discussion

According to the analysis the protein content and digestibility of Pekilo and Silva were on the same level (table 1). The most remarkable difference is in the content of raw fiber. This is, however, in contradiction with the results of digestibility trial. The digestibility of SCP-protein, 78-80 %, can be considered satisfactory but due to the low digestibility of carbohydrates is the ME-value of Pekilo and Silva rather low for fur bearing animals.

Table 1. The principal compositions of the rations in the SCP-experiments 1974-1977.

	Breeding animals (1976-1977)		Nursing females (1976-1977) and small kits (May-June)	Kits (1974-1976) July-November				
SCP in dm.	0	15	0	9	0	15	20	30 (1974)
Fish offal (cod) %	32-43	30-40	26-30	22-26	20-25	20-25	12-20	6
Fish meal "	3-4	1-2	4-5	2-5	2-4	0-1	-	-
SCP (Pekilo, Silva) %	0	5-6	0	3	0	5	7	10
The rest: slaughter house byproducts, baltic herring, cooked grain, suppl. fat, vitamins and minerals.								
Calculated % in dm								
digestible protein	37,0	36,0	40,5	40	34	33	33,5	32,5
" fat	11,5	12	15,5	15,5	13,5	14	13,5	14,5
" carbohydr.	20,5	19	15	15	22,5	21	21	20
*) ME Mcal (MJ)/kg dm	3,58 (15,0)	3,52 (14,7)	3,88 (16,3)	3,86 (16,2)	3,71 (15,5)	3,65 (15,3)	3,63 (15,2)	3,64 (15,2)
SCP % of dig. prot.	0	15-20	0	10	0	17	24	35

*) The low ME-value of SCP was partly compensated by supplementing more fat.
dm = dry matter

Table 2. The chemical composition, digestibility and calculated ME-value of Pekilo and Silva.

	Pekilo		Silva
Dry matter %	92,9		91,4
Protein (Nx6,25) % in dm.	49,6		49,4
Fat "	1,6		1,2
Fiber "	9,1		4,7
N-free extr. "	34,0		37,0
Ash "	5,7		7,7
1) Total nucleic acids %	6,9		9,2
Amino acids g/16 g N			
Methionine	1,3		1,5
Cystine	0,6		0,7
Lysine	6,6		7,7
Arginine	6,3		4,5
Histidine	2,2		2,0
Tyrosine	3,5		3,5
Phenylalanine	4,2		4,6
Isoleucine	4,3		4,9
Leucine	7,1		7,5
Threonine	4,5		5,0
Valine	5,1		5,3
Digestibility %	Mink	Finnraccoon	Mink
org. matter	55,4± 2,6	60,1± 7,6	48,9± 8,3
protein	78,2± 2,8	78,3± 4,3	80,3± 5,5
raw carbohydrates	30,4± 6,1	43,4± 12,0	9,8± 2,6
2) calc. ME Mcal (MJ)/kg dm	2,4 (10,1)	2,63 (11,0)	2,0 (8,4)

1) The shortened method of Ogur and Rosen [Arch. Biochem 25 (1950):262]

2) Digestibility of fat was calculated as 80 %

dm = dry matter

SCP had no negative effect on the breeding results (table 3) but the weight gain of kits during the first weeks was impaired even though the concentration of SCP was decreased before whelping (table 4). Any conclusions of increasing effect on mortality cannot be done. The later growth of male kits (July-November) was significantly impaired by SCP-feeding but the effect on females was not drastic. The results with Silva were better than with Pekilo but the difference was small on the 15 %-level. The differences in growth agreed with body and skin length (table 6). It is usual that the quality of fur will be better when the size of skin is smaller. According to the

Table 3 The breeding results of mink in the SCP-experiments in 1976-77

SCP % in dm	0	15	
		Pekilo	Silva
1976			
mated females	36	37	36
dead "	-	-	-
barren "	3	3	4
kits per mated female	4,1	4,1	4,8
" " whelped "	4,4	4,4	5,3
1977			
mated females	42	45	43
dead "	-	2	-
barren "	5	8	8
kits per mated female	4,2	4,3	3,7
" "whelped "	4,7	5,2	4,5

dm = dry matter

Table 4 The change in weight of breeding females in percentage during pregnancy and lactation. The weight of small kits (May-June) in 1976-77

SCP % in dm	0	15	
		Pekilo	Silva
1976			
Breeding females, change of weight %	+11,8	+12,3	+11,5
The weight of kits , g in one weeks' age	35,8	35,3	31,4^{x}
The weight of male kits, g 2.6.	186	167	183
The weight of female kits, g 2.6.	168	157	149
Mortality of kits %	0,7	-	2,4
1977			
Breeding females, change of weight %	-17,2	-15,8	-16,5
The weight of male kits g in 3 weeks' age	127	121	118^{x}
The weight of male kits g in 6 weeks' age	329	301^{xx}	313
The weight of females g in 3 weeks' age	112	110	107
The weight of females g in 6 weeks' age	284	252^{xxx}	265
Mortality of kits during the first 6 weeks %	-	4,2	-

Significance between means of control and treatment groups x $P < 0,05$
xx $P < 0,01$ xxx $P < 0,001$. (student t-test)

Table 5 The weight gain and mortality of mink kits in the SCP-experiments in 1974-76 (July-Oct. Nov.)
P=Pekilo S=Silva

	Males				Females			
	N	weight gain g	rel.	mortality number of kits	N	weight gain g	rel.	mortality number of kits
1974								
Control	12	1360	100	1	12	510	100	1
P - 15	12	1267	93	2	12	575	113	1
P - 30	12	816^{xx}	60	-	12	500	98	1
1975								
Control	40	1497	100	2	40	672	100	2
P - 20	40	1019^{xxx}	68	2	40	577^{xx}	86	1
S - 20	40	1249^{x}	83	4	40	628	93	1
1976								
Control	42	1607	100	1	42	696	100	1
P - 15	42	1341^{xx}	83	2	42	653^{x}	94	-
S - 15	42	1376^{xx}	86	2	42	686	99	2

Table 6 The size and fur quality of mink kits in the SCP-experiments in 1975-1976.

	Males							Females					
	N	Length of body cm	Length of skin cm	Density of guard hair	Density of underfur	Colour	General appea-rance	Points total	N	Size	Dens. of guard hair	Dens. of underfur	Colour
1975													
Control	35	43,7	67,6	6,3	5,6	6,6	6,1$_{xx}$	24,5	-	-	-	-	-
P - 20	36	41,4^{xxx}	61,0$_{xxx}$	8,0^{xxx}	7,3^{xx}	7,9^{xx}	7,1	30,3$^{xxx}_{x}$	-	-	-	-	-
S - 20	36	42,8^{x}	63,8	7,0	6,1	7,9^{xx}	6,6	27,7	-	-	-	-	-
1976													
Control	29	43,7	69,6	6,9	6,7	6,5	6,4	26,5	39	3,5	3,5	2,9	3,1
P - 15	29	42,6^{x}	65,6^{xx}	8,5^{xx}	7,4	6,9	8,2^{x}	31,0^{xx}	36	3,2	3,6	3,1	3,1
S - 15	28	43,1	66,5^{x}	6,6	6,5	7,5^{xx}	6,4	27,0	31	3,4	3,6	3,3^{xx}	3,4^{x}

Table 7 Blood analysis in the SCP-experiments in 1974 and 1976

		Hb g/100ml	Haemato crite %		Serum values total protein g/l	urea m mol/l	urate mol/l
Kits 1974 (Sept.Nov.)	N			N			
Control	20	18,6	-	15	76	7,8	250
Pekilo 15	20	18,5	-	15	75	8,2	277
Pekilo 30	20	17,5	-	15	72[x]	7,5	271
Females 1976 (Jan.,June,Sept.)							
Control	10	17,4	43,9	-	-	-	-
Pekilo 15	10	16,8	45,7	-	-	-	-
Silva 15	10	17,3	45,7	-	-	-	-
Kits 1976 (Sept. ♂♂ + ♀♀)							
Control	24	16,6	-	-	-	-	-
Pekilo 15	24	16,8	-	-	-	-	-
Silva 15	24	16,6	-	-	-	-	-
(Dec. ♂♂)							
Control	20	17,3	52,5	10	72	5,5	113
Pekilo 15	20	16,8	52,6	10	67	5,7	129
Silva 15	20	16,7	50,8	10	72	5,8	113

results in table 7 high concentrations of SCP can decrease Hb-values and serum total protein of mink and slightly elevate the level of serum uric acid. No abnormalities were found in obductions. In later growing phase 15 % Pekilo or Silva in dry matter or 5 % in the ration seems to be too high for mink kits. The writers' opinion is that 10 % of Pekilo or Silva in dry matter or digestible protein in this phase of production is quite safe. This means about 3 % in the ration. In the formulation of feed rations the relatively low energy value of the yeast and fungi should be considered.

Summary

In the experiments with mink 15 % of Pekilo and Silva, SCP-products from sulphite liquor of Finnish cellulose industry, proved to be suitable in the feeding of breeding animals but too high for mink kits. During May and June also 9 % Pekilo and Silva in dry matter was too high level. Therefore their concentration should be limited to 5 and 10 % in dry matter of mink feed in May-June and July-pelting respectively. The possibilities of using yeasts and fungi as a protein

feed for fur bearing animals are limited mainly for their low energy value 2,0 - 2,6 Mcal (8,4 - 10,9 MJ) ME/kg dm.

Reference: Kiiskinen, T. & Mäkelä, J. 1975
Encelligt protein som pälsdjursfoder
Subsektionen för pälsdjur inom NJF's
Husdjurssektion, Uppsala 18-20 September 1975.

Original Report.

HEAT PRODUCTION IN THE FUR CHEWING CHINCHILLA.

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Only af few reports have been published concerning the oxygen consumption and thermoregulation of the chinchilla (Drozdz & Gorecki, 1967; Orestti & McManus, 1971; Kulzer, 1974; Wand & Lu, 198o). Vanjonack & Johnson in 1973 reported that the oxygen consumption did not show a significant difference between the normal chinchillas and the fur-chewers. They also mentioned chinchillas that eat their fur have a significantly increased in thyroid activity, and assumed a possible explanation for the lack of increase in oxygen consumption of the fur-chewers, which was rather puzzling as to the role of physiological characteristics. In order to understand the role of thyroid function as a possible mechanism associated with oxygen consumption, we carried out experiments to investigate and reexamine the rate of oxygen consumption in the fur chewing chinchillas.

MATERIALS AND METHODS.

Throughout Jan-Mar 198o, 31 standard adult chinchillas obtained from a colony maintained at Shanghai Normal University was used

in this study. The animals were divided into two groups. 13 were fur-chewers (8 males and 5 females) and 18 were normal (1o males and 8 females). The animals were weighed during the period of testing (mean weight see Table 1) the body temperature was measured through the mouth. Resting metabolism was measured at a thermo-neutral zone of 2o ± o,5C^{o} (Drozdz & Gorecki, 1967; Wang & Lu, 198o) using a simple closed-system respirometer (Wang et al., 198o). Before starting the experiment all the animals were allowed to equilibrate for 3o min period. Each animal was tested at least 2-3 times.

The oxygen consumption was expressed in ml/g/Hr or ml/w^{n}, b=o.73 (Hart, 1971). The heat production was calculated according to formala: Kcal = 4.7 (litter of release). The relationship between heat production and the body weight is expressed in equation Kcal $W^{o.73}$/24hr. Test for significant difference between normal and chewer groups was performed with t-test. A value of P<o.o5 was considered to be significant.

RESULTS.

The results presented in Table 1 show that the amount of oxygen consumption is significantly higher in fur-chewers than in those of normal chinchillas in the thermoneutral zone. The female fur-chewers oxygen consumption increased 41.96% (P<o.ool) or 31.45% (P<o.ool) (table 1). As for the male chewers the oxygen consumption increased 38.4% (P<o.ool) or 37.o5% (P<o.oo2) (Table 1). As for the M/$W^{o.73}$, (M express the heat production) also show the fur chewers are 4o.72% higher in females and 52.48% in males than the normal chinchillas (P<o.ool). The difference between males and females of normal and fur chewing did not show very significantly over the range of 2o ± o.5C^{o} use in this study.

Table 1. Oxygen consumption and heat production difference of fur-chewed and normal chinchillas.

		fur-chewer		normal		
	sex	mean ±	S.D.	mean ±	S.D.	P
Wt.(g)	F	42o.1ooo	48.1o24	43o.125o	55.1351	P>o.o5
	M	445.1o5o	66.8o47	4o6.1ooo	47.9447	P>o.o5
ml/g/h	F	1.1216	o.15o8	o.79o3	o.o883	P<o.ool
	M	1.o248	o.1633	o.74o1	o.o83o	P<o.ool
$ml/w^b/h$	F	5.6458	o.9357	4.1195	o.4985	P<o.ool
	M	5.1574	o.8652	3.9235	o.5686	P<o.o2
$Kcal/w^b/h$	F	o.1265	o.o17o	o.o891	o.o1oo	P<o.ool
	M	o.1168	o.2o1o	o.o798	o.o189	P<o.o1
$Kcal/w^b/24$ h	F	53.9773	9.o665	38.3592	5.6181	P<o.ool
	M	5o.651o	6.3377	33.1384	4.1518	P<o.ool

DISCUSSION.

The fur-chewers have an abnormal physiological phenomen. They chew their own fur or their companions fur. It has been estimated 1o-3o% of the chinchillas have habit of chewing fur (Rees, 1963), this results in a heavy loss in the chinchilla fur industry. In our study it has been shown there is a significant difference in oxygen consumption and heat production between the groups (see Table 1). Another notable physiological abnormal phenomen of the fur chewing animals is their voracious appetitives. The food intake in normal chinchillas averages 25 g per day. As for the chewers their consumption is high, 4o-6o% extra intake daily. However, the habitual fur-chewers increase their metabolism and gradually become very thin and lose weight. This indicated that the assimilation and dissimilation are unbalance and unable to compensate the consumption, therefore the body weight was decreased.

Our study shows the characteristic of metabolism in the fur chewers. Data from the present study supports the concepts of hyperoidism

which affect oxygen consumption and heat production of the fur-chewers animals. Vanjonack & Johnson (1973) reported that the fur-chewers have a significant increase in thyroid activity, a significant high thyroxine secretion rate, from histological observation they found in the fur-chewers group, there appeared high columnar cells of the secretory epithelium and less colloid. This indicated a high functional state of the gland (Tunner, 1967). It is known hyperthyroidism cause the increase of basic metabolism, and the thyroid hormone plays an important role in mammal temperature control,heat production due to increase rate of secretion of thyroid. Since the normal chinchilla basal metabolic is 15-3o per cent below the mouse to elephant curve (Drozdz & Gorecki, 1967), when relating thyroid function to metabolic rate, thyroxine secretion rate was found to be low in species exhibiting low metabolic rate and vice versa (Yousef, 1975). Now the question arises why did Vanjonack & Johnson experiment's did not show a significant differences in oxygen consumption between the fur-chewers and the normal chinchillas expose at a thermoneutral zone ($22C^{o}$) as in our study. The only reasonable explanation is that the experiments which were used were to little and the testing measurements were only done once. Therefore they did not collect enough data to show any significance, and may be the possible explanation for the lack of significant.

The chinchilla has a low level of metabolism and not very intensive chemical thermoregulation, but it has an exceptionally good physical thermoregulation, the thick and fluffy fur cover (Wilcox 195o) has a high body insulation index at the thermoneutral zone at $2oC^{o}$ (Drozdz & Gorecki, 1967). As for the chewers they had 5o% less fur over the chewed areas (Vanjonack & Johnson, 1973), which would account for less insulation of pelage, thus, the fur chewers no longer expend a minimal of energy, also not sufficient enough to keep heat production and heat loss in balance, the metabolic increases, thus, increased thyroid activity.

In conclusion the most significant finding og this study is the results of significant difference of oxygen consumption and heat

production between the normal and fur-chewer chinchillas. The experimental data further emphasized the general importants of thyroid activity as a stimula.

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EMBRYONIC DEATH IN MINK DUE TO RIBOFLAVIN DEFICIENCY.

Arne Helgebostad, Dal Forsøksgård, 1380 Heggedal, Norway.

Experimental studies with mink in the breeding season have shown how riboflavin deficiency can cause embryonic death and abortion. Riboflavin deficiency has been produced experimentally by adding to the feed 10-20 mg galactoflavin-anti B_2vitamin- per animal daily during the pregnancy. The experiment included 44 standard female mink (see table)

Table Breeding results.

	Daily doses per ♀	Number ♀ in experiment	Number ♀ that bore kits	Unproductive ♀	Number of living kits per mated ♀
Gr. A	Galactoflavin 10—20 mg	16	0	16	0
Gr. B	Galactoflavin 10—20 mg Riboflavin 50—100 mg	6	4	2	3.5
Gr. C	0	22*	16	5	3.9

* 1 died in connection with delivery.

Riboflavin deficiency led to embryonic death, none of the mated females in the deficient group A delivered kits. At the expected time of birth, six of the females were subjected to uterectomy or investigative laparatomy, which showed reminants of embryos that were mostly decomposed. (Fig. 1).

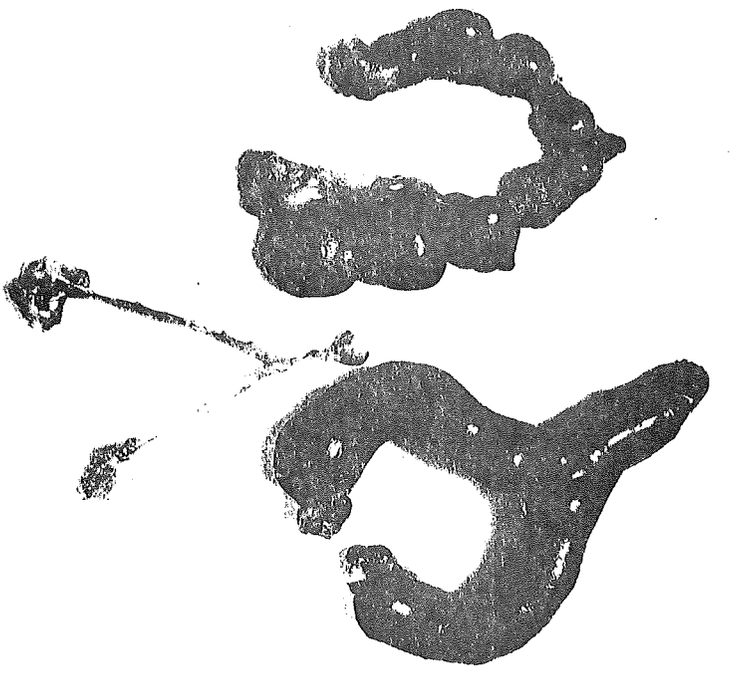


Fig.1
Uterus from 3 mink.

Above, uterus with small prominences after 7 - 8 foetuses from a female in 51st day of pregnancy gr. A.

Bottom, distinct prominences in uterus after 9 foetuses in 52nd day of pregnancy gr. A.

In the middle, uterus from a juvenile female on normal diet, killed 9. May.

In a parallel group B, four of six females on the same diet with the same doses of galactoflavin, but with 5o-1oo mg riboflavin added daily, delivered normal litters (table 1).

The animals in the control group C were on the same diet as those in groups A and B, but no galactoflavin or riboflavin was added to their diet. Sixteen of the females had litters, five were unproductive and one died in giving birth.

The experiment included as well five males and the same number control animals on the basic diet. In the experimental group the basic diet was supplemented with 3o mg galactoflavin per animal daily from 15/12-18/3. The fertility of these males was not influenced in a negative way.

Nord. Vet. Med. 198o, 32, 313-317.
2 tables, 2 figs., 6 references.

Authors summary.

● EFFECTS OF DIETARY MERCURY ON MINK.

R.J. Aulerich, R.K. Ringer, S. Iwamoto, Fur Animal Project, Poultry Science,Department, Michigan State University, East Lansing, Mich.48824, USA.

A study was conducted to ascertain the effects of dietary mercury on mink. Five parts per million of dietary methylmercury was lethal to adult mink in about one month. Ten parts per million of mercuric

chloride in the diet for five months did not produce adverse effects. Clinical signs of methyl mercurialism were anorexia, loss of weight, incoordination, tremors, and paroxysmal convulsions. The latency period was about 24 days, survival time averaged 33 days. Pathological changes were evident in the tissues of the mink that died of mercury poisoning. Tissue mercury residue analyses showed the highest concentration of mercury in tissues from mink fed methylmercury.

Archives of Environmental Contamination and Toxicology, Vol.2, no.1, 1974. 43-51. 6 tables, 25 references. Authors abstract.

● PROTEIN METABOLISM IN FUR-BEARING CARNIVOROUS ANIMALS. V. BLOOD SERUM ALBUMIN TURNOVER OF ARCTIC FOXES FED ON DIFFERENT DIETS.

(Przemiana bialek u zwierzat futerkowych miesożernych. V. Obrót albuminy surowicy krwi u lisów polarnych żywionych roźnymi dawkami pokarmowymi.)

Henryk Bieguszewski, Katedra Fizjologii Zwierzat WSR w Olsztynie. Poland.

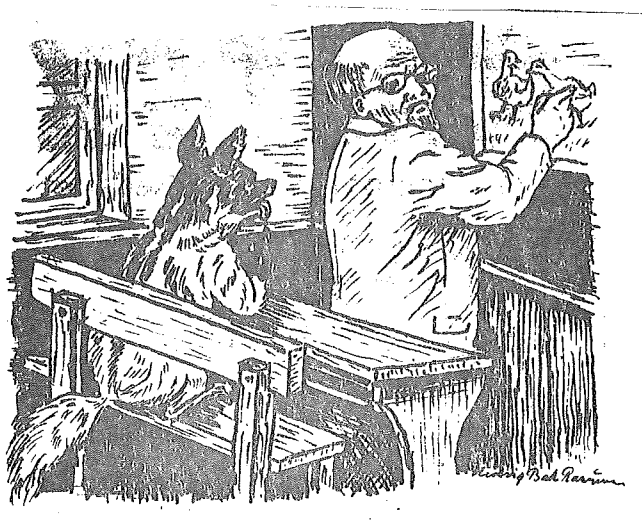
Investigations were carried out on 46 Arctic foxes including the determination of: total blood volume, intravessel and extravessel albumin pool, relative and absolute albumin turnover-rate, and biological half time of albumin. The foxes were fed on diets containing different amounts of crude protein or protein of animal origin.

The blood volume expressed as percent of body weight was higher in adult foxes fed on low protein diets, than i animals given normal quantities of protein in feed. No significant differences were found in the total albumin content in adult foxes kept on a diet of different protein level. In young foxes given the largest amount of protein the total albumin pool per 1 kg body weight increased significantly.

A statistically significant decrease was found in the relative and absolute albumin turnover rates, with declining protein intake. Animals given the least amount of protein in the feed had the longest biological half time of albumin. Metabolism of plasma albumin in young foxes was significantly more intensive than in adult animals.

The total blood volume was not affected by increased proportion of plant protein in the diet. No significant effect was observed of the replacement of animal protein in the diet by plant protein on the toal albumin pool and recovery rate of albumin.

Rocznikj Nauk Rolniczych, 1971, B-94-4.
21 references. Authors summary.
In Polish with summaries in English and Russian.



You always have to remember
that the main difference between
plant protein and animal protein
is the taste!

ORGAN DISTRIBUTION OF SOME CLINICALLY IMPORTANT ENZYMES IN MINK.

T. Juokslahti, P. Lindberg, J. Työppönen, Dept. of Biochemistry, College og Vet. Med., P.O. Box 6, oo55o Helsinki 55, Finland.

The activity and relative distribution of eight clinically important enzymes were measured in nine different organs in lo healthy minks. Of the enzymes studied, OCT, ASAT and ALAT had higher absolute activities when compared to many other animals. This is believed to be adaptation to a high protein diet. OCT shows absolute liver specificity, and even ALAT is relatively liver specific in mink. SDH is found in relatively high concentrations in the liver as well as in the kidney. The organ distribution of the other enzymes investigated in mink - AP, CK, γ-GT and LD - is much the same as in many other animal species . Their clinical significance in serum is therefore the same.

Acta vet. scand. 198o, 21, 347-353.
2 tables, 21 references.

Authors abstract.

CLASSIC SLOW VIRUS DISEASES.

E.H. Lennette, Biomedical Laboratories, State of California Dept. of Public Health, Berkeley, California, USA.

Two human diseases, kuru and Creutzfeldt-Jakob disease, and two animal diseases, scrapie and mink encephalopathy, comprise the group designated the subacute spongiform encephalopathies. Studies on these four classic conditions have generated a new philosophy, new concepts, and new technology that provide a basis for the study of chronic diseases and latent infections of man and animals. These aspects are discussed more broadly and in variable

details in the references listed on the following page.

Table 2. Chronic infections of the animal central nervous system with unconventional agents.

Disease	Virus	Hosts affected	Incubation period	Clinical signs	Major findings
Scrapie	Infectious agent passes through filters of 30-nm pore size	Sheep, goat, mouse, rat, gerbil, mink, cynomolgus and squirrel monkey, skunk, hamster	30-60 months	Ataxia, tremors, hyperexcitability, incoordination	Similar to kuru, with some PAS-positive doubly refractile birefringent amyloid plaques; involvement of subcortical regions, particularly medulla; outstanding vacuolation of nerve cells
Transmissible mink encephalopathy	Infectious agent passes through filters of 50-nm pore size	Mink, skunk, raccoon, ferret (including albino ferret), hamster, goat, sheep, Old World monkeys, New World monkeys	4-48 months	Slowly progressive locomotor incoordination, excitability, convulsions	Similar to scrapie; involvement most prominently of cerebrum, especially its more rostral parts; marked astrogliosis and spongy degeneration of gray matter

Source: Fucillo et al. (2).

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PAHO BULLETIN, Vol.XI, No.2, 1977.
2 tables, 6 references.

Authors summary and copy of table 2 and reference list.

COMPARATIVE HEMATOLOGY: MAMMALIAN PLATELETS.

Jessica H. Lewis, Dept. of Medicine, University of Pittsburgh, and Central Blood Bank of Pittsburgh, Pittsburgh, Pa. USA.

As part of a comprehensive study of comparative vertebrate hematology the blood from many species of Mammalia was examined. The studies to be described compare animal platelets with human platelets in function and in ultrastructural detail. Their functions in hemostasis appear similar to those of human platelets although some reactions and microstructural details differ.

The major roles of human platelets in the hemostatic mechanisms are:

(a) the formation of the platelet plug or white thrombus. (b) release of phospholipids (platelet factor 3) and (c) clot retraction. The formation of the primary hemostatic plug is dependent upon the ability of platelets to adhere to collagen fibers and release their own adenosine diphosphate (ADP), which causes aggregation or the sticking of one platelet to another. Thrombin converts the aggregated platelets to an irreversible mass or plug. Thrombin is formed through both the extrinsic and intrinsic coagulation pathways. Platelet factor 3 is an essential component of the intrinsic route. Platelets are also necessary in clot retraction.

Comparative hematology

TABLE 1 *Properties of mammalian platelets (averages for each species)*

Animal	No. of animals	Platelet count x 10^3/cu mm	Size*	Percent adhesion to glass	Aggregation (as %) ADP	Human/bovine collagen	Animal collagen
Echidna	2	574	v	–	–	–	–
Wallaby	1	390	v	–	–	–	–
Quokka	1	1,180	v	–	–	–	–
Opossum	11	503	3	52	96	0-62	0-68
Hedgehog	1	293	4	–	100	100	100
Monkey	7	491	3	57	70	0	–
Armadillo	5	364	3-v	37	70	0	
Rabbit	12	278	2½	80	62[B]	80	55
Guinea pig	10	447	3	60	92	5	97
Rat	6	675	1½	26	–	–	–
Mouse	4	802	2	–	–	–	–
Porpoise	9	133	4-v	27	95	100	–
Dog	6	291	3	44	72	45	–
Raccoon	2	889	2	72	100	100	100
Fox	1	109	3-v	–	–	–	–
Cat	4	217	3	38	78	94	96
Mink	3	787	3-v	–	70	0	0
Seal	1	763	3	–	–	–	–
Elephant	4	637	3-v	26	63[B]	69	–
Manatee	2	470	2	12	100	0	–
Horse	10	241	2	54	70	70	64
Pig	14	446	2	16	77	100	–
Cow	6	349	2	56	58	49	–
Sheep	6	501	1	81	57	67	80
Goat	3	621	1	73	90	80	–

* Size: 1 = very small, 2 = small, 3 = human-like, 4 = larger than human, v = very variable in size. B = biphasic.

Proc. Int. Symp. Blood Platelets, 1974.
Excerpta Medicin, Int. Congress Serie 1975, 357. 18-23 (6).
2 tables, 6 figs.,8 references.

Authors abstract.

● ANTIBODY-FORMING CELLS AND SERUM HEMOLYSIN RESPONSES OF PASTEL AND SAPPHIRE MINK INOCULATED WITH ALEUTIAN DISEASE VIRUS.

Donald L. Lodmell, R. Kay Bergman, William J. Hadlow, Rocky Mountain Laboratory, Natl. Inst. of Allergy and Infectious Diseases, Hamilton, Montana 5984o, USA.

The effect of Aleutian disease virus (ADV) on serum hemolysin titers and antibody-forming cells in lymph nodes and spleens of sapphire and pastel mink inoculated with goat erythrocytes (G-RBC) was investigated. ADV injected 1 day after primary antigenic stimulation with G-RBC did not depress the immune responses of either color phase for a period of 26 days. However, when G-RBC were injected 47 days after ADV, both the number of antibody-forming cells and hemolysin were more markedly depressed in sapphire than in pastel mink. The results are discussed in relation to the greater susceptibility of sapphire mink and the variable susceptibility of pastel mink to the Pullman isolate of ADV.

Infection and Immunity, Nov. 1973, 769-774, Vol. 8, no.5.
1 table, 3 figs., 16 references.

Authors abstract.

● STUDIES ON THE PATHOGENESIS OF ALEUTIAN DISEASE IN MINK. IX. OCCURRENCE OF AUTO-ANTIBODIES.

(Untersuchungen über die Pathogenese der Aleutenkrankheit der Nerze. IX. Vorkommen von Autoantikörpern.)

G. Trautwein, R. Wacker, R. Müller-Peddinghaus, Tierärztliche Hochschule Hannover, Institut für Pathologie, Bischofsholer Damm 15, D-3ooo Hannover.

The type of autoantibodies that occurs in experimental Aleutian Disease (A.D.) in mink is defined and the antibody titres in different phases of the disease are recorded. The techniques include

the immunofluorescence test, passive haemagglutination, countercurrent electrophoresis and the Coombs antiglobulin test. A total of 43 sera from mink experimentally infected with AD virus and 12 control sera were examined for anti-nuclear antibodies. The substrates used were liver and kidney from mink and rats, fowl erythrocytes, pig leucocytes and calf thymocytes.

Antinuclear factor at a lower titre also occurred in individual uninfected control mink. After infection with AD virus there was a rise in antibody titre with a peak 3-4 months after infection. Attemps to demonstrate antibodies against cytoplasmic antigen in the tubular epithelium of the kidney and the bile duct epithelium in the liver gave negative results. Antibodies against smooth muscle were found in titres from 1:4 to 1:256 in 2 of 4 control sera and in 16 of 17 sera from AD affected mink.

Passive haemagglutination demonstrated antiglobulin factor in a titre of 1:16 and higher in 2o of 36 sera (55,6%). In 6 of 9 control sera the titre was 1:8. To demonstrate DNA antibody the mink sera were tested by countercurrent electrophoresis against heat-inactivated DNA. This technique showed that 4 of 12 control sera contained DNA antibodies in low titre. In mink with AD the titres were markedly higher and reached peaks 2-3 or 5-8 months after infection. No reproducible results were obtained with the Coombs test.

The results of these experiments allow the following conclusions: Antinuclear antibodies probably represent a serological epiphenomenon and are only slightly increased in the course of persistent AD infection. DNA antibodies, as demonstrated, possibly have some significance in the pathogenesis of AD since the titre of these autoantibodies is markedly higher than in uninfected controls.

Zbl. Vet. Med. B. 26, 748-771, 1979.
5 tables, 1o figs., 5o references.
In German with summaries in
German, English, French and Spanish.

Authors summary.

STUDIES ON THE PATHOGENESIS OF ALEUTIAN DISEASE OF MINK. X. DEMONSTRATION OF IMMUNE COMPLEXES BY THE ^{125}I-C 1 q BINDING TEST AFTER EXPERIMENTAL INFECTION.

R. Müller-Peddinghaus, H. Meyer zu Schwabedissen, J.R. Kalden, G. Trautwein, S. Ueberschär, Kali-Chemie Pharma, Dept. of Expt. Pathology, Hans-Böckler-Allee 2o, D-3ooo Hannover 1.

Aleutian disease (AD) of mink most closely resembles systemic lupus erythematosus (SLE) in man; both are immune complex diseases. In experimental AD serum immune complexes are determined by the ^{125}I-C 1 q-binding test using human C 1 q. Mink (n = 12) infected intraperitoneally with Aleutian disease virus (ADV), grown in fetal mink kidney cells, developed during the course of infection a mean of ^{125}I-C 1 q serum binding equivalent to 3.62±1.68 mg/ml aggr. HGG (aggregated human immunoglobulin). Sera of mink (n = 8) which were infected with ADV grown in L-cells showed a less marked ^{125}I-C 1 q binding with a mean equivalent to 2.52±1.43 mg/ml aggr. HGG. In contrast control animals (n = 8) treated with non-ADV-infected mink epidermal fibroblasts or Eagle's minimal essential medium substituted with fetal calf serum only bound ^{125}I-C 1 q equivalent to 1.o2±o.99 mg/ml aggr. HGG.

In mink infected with ADV propagated in fetal mink kidney cells a constant increase in the ^{125}I-C 1 q serum binding occurred from the 4th to the 7th and 13th week after ADV infection. Mink which were infected with ADV propagated in mouse L-cells exhibited a different pattern of the ^{125}I-C 1 q serum binding capacity with a sharp increase from the 4th to the 7th weeks, followed by a decline towards the 13th week post infection.

The serum ^{125}I-C 1 q binding capacity of all experimental animal groups exhibited at different times of the experiment a significant correlation with the presence of hypergammaglobulinaemia and raised ADV-antibody titers.

From the data obtained it appears that the ^{125}I-C 1 q binding test, utilizing human C 1 q, is a suitable method for the detection of circulating serum immune complexes in mink during the course of ADV-infection.

Zbl. Vet. Med. B. 27, 1-1o, 198o.
1 table, 4 figs., 22 references.
In English with summaries in
English, German, French and Spanish.

Authors summary

● POLY IC THERAPY IN ALEUTIAN DISEASE OF MINK.

A.S. Russell, J.S. Percy, H.J. Cho, Room 9112 A, Clinical Sciences Building, University of Alberta, Edmonton, Alberta, T6G 2G3,

Twenty-four virgin female aleutian mink were infected with aleutian disease agent and after 24 hours, 12 of these were treated with a course of polyinosinic acid-polycytidilic acid (Poly IC) injections. After six weeks the gammaglobulin level was significantly lower in the treated group but at 13 weeks this difference was no longer present. Four of the treated mink had normal target organ histology when killed at 2o weeks. The untreated group all showed moderate to marked changes but this difference was not statistically significant.

There was a marked increase in the reactive lymphocyte blastogenesis index during the first weeks of infection and the phytohaemagglutinin response was seen to fall progressively. The antiglobulin reaction usually became positive after infection but neither antinuclear nor antierythrocyte antibodies were found. Precipitating antibodies to several polynucleotides were frequently present and were unrelated to infection or to Poly IC treatment.

Can. J. comp. Med., Vol. 39, July 1975, 24o-249.
4 tables, 3 figs., 29 references.
Abstracts in English and French. Authors abstract.

● CANINE PARVOVIROSIS: THE INGESTION OF ORGANS FROM A MINK INFECTED WITH VIRUS ENTERITIS REPRODUCES THE SPONTANEOUS DISEASE IN THE DOG.

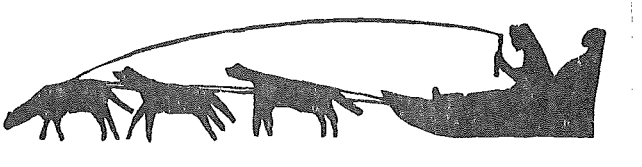
(Parvovirose canine: L'ingestion D'organes de Vison Atteint D'entérite a Virus Déclenche chez le chien une Maladie identique a la Maladie Spontanée.)

Anne Moraillon, R. Moraillon, J.M. Person, A.L. Parodi,
Chaire de pathologie médical de l'Ecole nationale vétérinaire d'Alfort, F 94704 Maisons-Alfort Cédex, France.

Pups, seven weeks of age, orally contaminated by an intestine extract from a mink infected with virus enteritis developed a lethal enteritis which was exactly identical to canine parvovirus gastroenteritis as to its clinical, hematologic, virologic, serologic and anatomo-patholigic characteristics. The disease was spontaneously transmitted to a control pup deliberately placed in contact with the previous ones. Because of the haemagglutination properties with cats and rhesus monkeys erythrocytes the re-isolated viral strain is closer to canine parvovirus than to feline panleucopenia virus. These findings provide an experimental argument to the hypothesis of the transmission of enteritis virus from the mink to the dog, with or without mutation, which is at the origin of the late emergence of parvovirosis in the dog.

Rec. Méd. vét., 1980, 156, 7-8, 539-548.
6 tables, 24 references.
In French with summaries in
English, French and Spanish.

Authors summary.



ISOLATION OF REOVIRUS FROM MINK.

(Der Nachweis von REO-Viren bei Nerzen).

R. Kokles, Thierfelder Strasse, DDR-252 Rostock 22.

In this first report of the isolation of reovirus from mink, isolates were obtained from 18 to 26 young mink with viral enteritis, by using cultures of cat kidney cells. The isolated also produceed cytopathic changes in cell cultures of mink kidney, dog kidney, piglet kidney, calf kidney, bovine embryonic kidney and calf testis. A characteristic feature was the formation of eosinophilic inclusion bodies in the cytoplasma of culture cells. Haemagglutination tests were negative with erythrocytes from cat, rabbit, pig, horse and cattle. Attempts to infect old and young mink, kittens and ferrets with tissue culture material failed. It was not known to what extent this second infection with reovirus influenced the course of mink viral enteritis.

Arch. exper. Vet. med. Bd. 29, H.5, 781-788.
1 table, 4 figs., 15 references.
In German with summaries in
German, Russian and English.

Authors summary.

CHARACTERIZATION OF A RETROVIRUS ISOLATED FROM NORMAL MINK CELLS CO-CULTIVATED WITH A DOG MAMMARY TUMOUR.

M. Ahmed, J. Yeh, R. Stephens, H.E. Holden, The John Smith Memorial for Cancer Research, Pfizer Inc., Maywood, N.J. 07607, USA.

J. Schlom, W. Drohan, D.K. Howard, Natl. Cancer Institute, NIH USPHS, Bethesda, Md 20014, USA.

A retrovirus antigenically distrinct from known type C, B and D viruses was isolated from normal mink (Mustela vison) lung cells that had been co-cultivated with 5-iododeoxyuridine- and dexamethasone-treated dog mammary tumour cells. Cytogenetic studies of the

virus-releasing co-culture showed mitotic figures identical to the normal mink cell line (Mv1Lu) with the exception of a low frequency of cells with extensive chromosomal breakage and uncoiling. The new virus bands at a buoyant density of 1.16 g/ml, contains 60S RNA and a reverse transcriptase which prefers Mn^{2+} for the synthesis of DNA. This enzyme utilizes poly(rA).oligo(dT) more efficiently than poly(dA).oligo(dT) and is also able to synthesize DNA copies from the endogenous RNA. Morphologically, it is a typical type C virus.

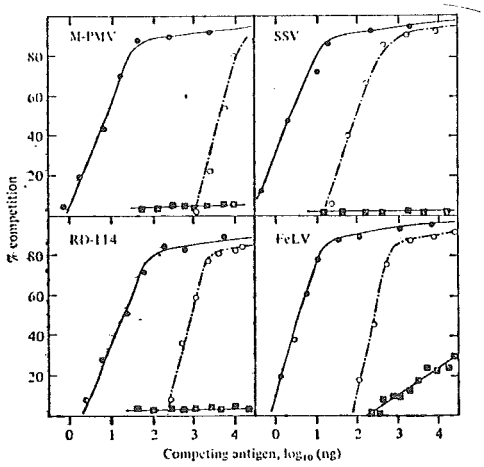


Fig. 1. Competition radioimmunoassays demonstrating relationships of MiRV with other mammalian retroviruses. MiRV was banded twice and disrupted with 0·05 M-tris buffer, pH 7·9, containing 0·25% Triton X-100 and 0·02 M-dithiothreitol and tested at various protein concentrations as competing antigen in homologous p30 assays of M-PMV, SSV, RD114 and FeLV. O—O, Homologous p30; O- -O, cell extracts from cultures producing the homologous virus; ■—■, disrupted MiRV.

Filtered virus readily infects mink, dog and other mammalian cells indicating the amphotropic nature of its cell growth requirement. Hybridization studies showed that normal mink DNA contains multiple copies of proviral sequences of this newly isolated virus Serological analyses indicate that the mink endogenous virus contains in its core protein, in addition to the interspecies type-C determinant, an antigenic component related to one of the determinants found in the feline leukaemia virus p30 protein. This determinant is not present in the Rauscher leukaemia virus, RD114 virus or simian sarcoma virus.

J. gen. Virol. 1979, 42, 179-184.
1 table, 1 fig., 14 references.

Authors summary.

ENDOGENOUS TYPE C RNA VIRUS OF MINK (MUSTELA VISON).

Vaclav Klement, Mary F. Dougherty, Pradip Roy-Burman, Bijay K. Pal, C. Susan Shimizu, Robert W. Rongey, Walter Nelson-Rees, Robert J. Huebner, Dept. of Pediatrics and Microbiology, University of Southern California School of Medicine, Los Angeles, California 90033, USA.

A type C RNA virus was isolated from mink lung cell line (American Type Culture Collection No. CCL 64) which had been cocultivated with 5-bromodeoxyuridine (BUDR)-treated mouse spleen cells. The virus has type C RNA virus morphology as demonstrated by electron microscopy. The complement fixation and immunofluorescent tests performed with mouse anti-p30 antisera show a distinctive difference between mink and mouse type C viruses. Complement fixation tests also indicate that mink type C virus is antigenically different from rat, feline leukemia, feline endogenous (RD-114), baboon, and woolly monkey type C viruses.

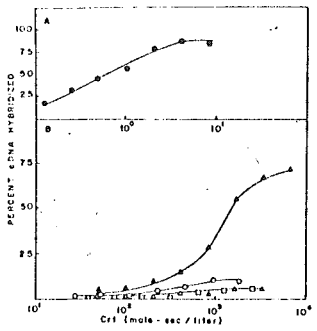


FIG. 6. Hybridization of viral cDNA to cellular RNA. [^{3}H]cDNA was hybridized to varying concentrations of RNA from the homologous virus (●), virus-producing mink lung cells (▲), uninfected mink lung cells (○), mouse LC spleen cells (□), and mouse SC-1 cells (△).

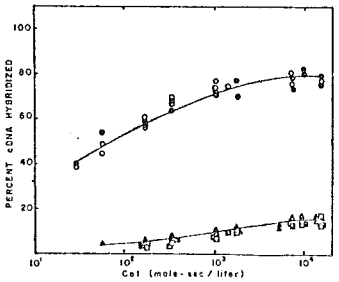


FIG. 7. Hybridization of viral cDNA to cellular DNAs. DNA-DNA hybridization was performed as described in the text. [^{3}H]cDNA was annealed to DNA from uninfected mink lung cells (●), virus producing mink lung cells (○), mouse LC spleen cells (■), mouse SC-1 cells (△), rat NRK cells (▲), and cat lymphoma (□).

The virus propagates in celles of mouse, rat, cat, sheep, dog and human origin, but not in bovine (MDBK) or simian (BSC-1) cells. The infection of rabbit (SIRC)cells and cells of virus origin (mink lung) was followed by delayed and low-titer polymerase release in tissue culture media. The virus sediments in sucrose density gradients as a broad band of densities, 1.13-1.17 g/ml, and contains 70 and 4 S RNA. The protein profile is similar to that observed in other mammalian type C viruses. The DNA complementary to the poly(A)-containing virion RNA hybridized to a high degree (72%) with the RNA from virusproducing mink lung cells but

not with the RNA from mouse cell lines or uninfected mink lung cell line. The nucleotide sequences homologous to mink viral cDNA were found in mink cell CNA from both virus-producing and nonproducing cells, but not in the DNA of mouse, rat or feline origin. The virus here described therefore represents an endogenous mink type C virus.

Virology 85, 296-3o6, 1978.
6 tables, 7 figs., 33 references.

Authors summary.

ENDOGENOUS MINK (MUSTELA VISON) TYPE C VIRUS ISOLATED FROM SARCOMA VIRUS-TRANSFORMED MINK CELLS.

Charles J. Sherr, Raoul E. Benveniste, George J. Todaro,
Laboratory of Viral Carcinogenesis, Natl. Cancer Inst.,
Natl. Inst. of Health, Bethesda, Maryland 2oo14.

A previously described type C virus stock (designated PP-1R),isolated by cocultivating baboon cells with mink cells transformed by Kirsten sarcoma Virus (64J1), has been further cloned and characterized. End point-diluted stocks of PP-1R have been obtained that are free of focus-forming activity and lack both Kirsten sarcoma and primate type C viral sequences. Nucleic acid hybridization experiment show that the cloned virus (MiLV) is an endogenous, genetically transmitted virus of the mink (Mustela vison). MiLV replicates in canine, feline, and 64J1 mink cells but not in an untransformed mink cell line. Multiple viral gene copies can be detected in the DNA of normal mink cells in culture and in normal mink tissues; related endogenous viral genes are also detected in several related Mustela species. The virus codes for a p3o protein very closely related antigenically to that of feline leukemia virus but contains p15 and p12 proteins that are antigenically distinct. The mink cell line, Mv1Lu, and its Kirsten sarcoma-transformed derivative, 64J1, express relatively low levels of type C viral RNA related to MiLV and normally do not produce detectable levels of

MiLV p3o protein or complete, infectious viral particles. Infection of sarcoma virus-transformed mink cells with baboon type C virus, however, can augment the level of expression of endogenous mink viral RNA and can result in the synthesis and packaging of mink viral RNA and p3o antigen in extracellular virions. Since the Mv1Lu cell line and its transformed derivatives have become widely used in studies of retroviruses, the possibility of activating endogenous mink viral genes should be considered by investigators working with these cells.

J. of Virology, Mar. 1978, 738-749. Vol. 25, no.3.
3 tables, 7 figs., 52 references.

Authors summary.

● HIGH PLASMA CHOLESTEROL IN MINK (MUSTELA VISON) WITHOUT ATHEROSCLEROSIS.

D.B. Zilversmit, Thomas B. Clarkson, L.B. Hughes, Division of Nutr. Sci., and Section of Biochemistry, Molecular and Cell Biology, Div. of Biological Sciences, Cornell University, Ithaca, N.Y. 14853, USA.

Mink fed a commercial ration moderately high in cholesterol or fed a cholesterol-free semipurified diet have plasma cholesterol concentrations similar to that found in human beings living in industrialized countries. In contrast with human beings, 8o% of the plasma cholesterol in mink is carried in the high density lipoprotein fraction. Aortas and coronary arteries from animals up to 8 yr old were found to be free of fatty streaks and atherosclerotic plaques, both grossly and microscopically.

Atherosclerosis, 26, 1977, 97-1o2.
4 tables, 1 fig., 13 references.

Authors summary.

AN EXPERIMENTAL MODEL IN MINK FOR STUDYING THE RELATION BETWEEN AMYLOID FIBRIL PROTEIN AA AND THE RELATED SERUM PROTEIN, SAA.

G. Husby, J.B. Natvig, K. Sletten, K. Nordstoga, R.F. Anders,
Institute of Immunology and Rheumatology, Rikshospitalet, Natl. Hosp. of Norway, University Hospital, and Vet. Inst. and Biochemical Institute, University of Oslo, Oslo, Norway.

Experimental amyloidosis was induced in mink by repeated injections with endotoxin. Amyloid fibrils extracted from liver and spleen were fractionated by gel filtration after treatment with guanidine-hydrochloride and a reducing agent, dithiothreitol. An elution profile very similar to that of human amyloid fibrils, having protein AA as a major component, was obtained. The mink amyloid protein eluted at a position similar to that of human protein AA was by amino acid composition and partial sequence studies shown to be very similar to the latter protein and was called mink protein AA. In addition, a protein AA-related component (protein SAA) was found in increased amounts in serum of amyloidotic mink, providing further evidence of the homology with human amyloidosis. Experimental amyloidosis in mink represents a suitable model for studying amyloid proteins and related serum components.

Scand. J. Immunol. 4, 811-816, 1975.
2 tables, 2 figs., 16 references.

Authors summary.

SERUM PROTEINS IN MINK WITH ENDOTOXIN-INDUCED AMYLOIDOSIS AND INFECTIOUS PLASMACYTOSIS.

S.F. Mohn, K. Nordstoga, National Veterinary Institute, Postbox 8156, Oslo Dep., Oslo 1, Norway.

The serum proteins in Sapphire mink from the experimental and control groups in 2 endotoxin experiments and in a group of normal mink of the Standard type, were separated electrophoretically on cellulose acetate membranes.

In experiment No. 1, in which the experimental mink were given repeated injection of endotoxin, and the controls were untreated, significantly increased total protein and significantly decreased albumin concentrations in the experimental group compared to the normal group were demonstrated. The concentration of the $alpha_1$-globulin was significantly elevated and the $alpha_2$-globulin significantly reduced in the experimental and the control groups compared to the normal group. Significant differences between the gamma-globulin concentrations in the various groups were not found.

In experiment No. 2, all the animals were inovulated intraperitoneally with a crude tissue suspension containing the plasmacytosis agent 1o days before the experimental animals received the first of a series of injections with endotoxin. Significantly increased concentrations of total protein and gamma-globulin and significantly decreased albumin concentrations were, compared with the normal group, demonstrated in sera collected from the experimental group on the 94th, 2o1st and 254th day after the first injection of endotoxin. In the control group, compared with the normal group, significantly elevated concentrations of total protein, $alpha_2$-, beta- and gamma-globulins and significantly reduced albumin- and $alpha_1$-globulin were found but only in the second set of samples, while significantly decreased albumin- and significantly increased gamma-globulin concentrations were found in the third set.

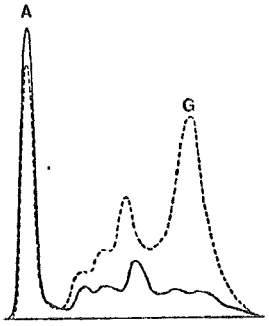


Figure 2. Electrophoretic patterns of sera from the healthy mink No. 900 T (drawn line) and from mink No. 26 in the experimental group of experiment 2 (broken line).
A = albumin fraction. G = gamma-globulin fraction. The globulin fractions between A and G are alpha$_1$, alpha$_2$ and beta.

The results showed no significant differences between the gammaglobulin concentrations or between the other serum fractions in the experimental and the control groups in the 2 experiments. A possible explanation may be that there is no direct interrelationsship between hypergammaglobulinaemia and amyloidosis, and that a common basic mechanism may stimulate related stem cells which thereafter differentiate in different ways.

Acta vet. scand. 1975, 16, 288-296.
1 table, 2 figs., 16 references.
In English with summaries in English and Norwegian.

Authors summary.

● TOXICITY OF THE POLYCHLORINATED BIPHENYL AROCLOR 1016 TO MINK.

R.J. Aulerich, R.K. Ringer, Michigan State University, East Lansing, Michigan 48824, USA.

Effects of the PCB Aroclor 1o16 on reproduction, growth, and survival of mink (Mustela vison) were investigated. Mink raised according to commercial mink-ranch procedures were fed diets that contained o, 2, 1o, and 25 ppm Aroclor 1o16 for up to 18 months. Reproduction was not adversely affected, although kit growth and survival were suboptimum in some of the treated groups. No hematologic differences

were observed between the treated and non-treated mink, but heart weight increased and kidney weight decreased in the older animals of two of the three PCB-treated groups. No consistent gross lesions associated with PCB toxicity were observed. The PCB residue in mink tissues was directly related to the quantity of Aroclor 1016 in the diet. Residues in mink kits suggest that Aroclor 1016 passes the placental barrier.

Technical Report No. EPA-600/3-80-033, 32 pp.
11 tables, 28 references.

Authors abstract.

This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161.

● LETHAL HYPERKERATOSIS FOUND IN STANDARD DARK MINK.

T.M. Schwartz, American Scientific Laboratories, P.O. Box 7130, Madison, Wisconsin 53707, USA.

"In late August, 1979, 3 dark male kits were presented to our laboratory. The mink had abundant small nodules around the nose, eyes, tail and legs. In addition there were sparsely scattered nodules over the remainder of the body. The 2 most severely affected mink had swollen feet with the hair missing between the toes. The ears on all 3 mink were swollen with an irregular surface.

"Histologically, the skin exhibited hyperkeratosis with areas of purulent folliculitis, while the lungs exhibited chronic fibropurulent pneumonia. No other significant microscopic lesions were noted.

"No viruses or ectoparasites were isolated. *E. coli* was isolated from the lungs and the yeast obtained from the nodules on the tail. The cause of this condition is thought to be genetic in origin. Information to date indicates the disease is inherited as a simple autosomal recessive."

Author's remarks:

Since this article was written, I have observed this condition in dark kits on 2 additional ranches. Both cases were seen the last full week in August.

Fur Rancher, May 1980, p.12.

5 photos. Authors abstract.

LAGOCHILASCARIS MAJOR IN A RACCOON.

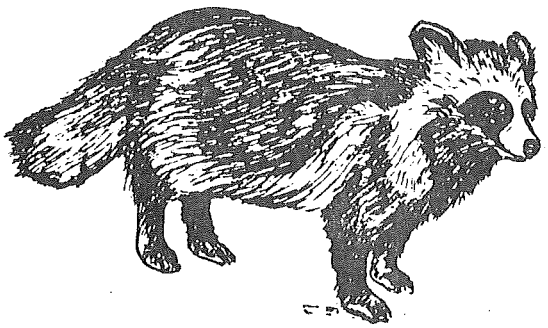
T.M. Craig, R.M. Robinson, H.H. McArthur, R.D. Ward, Dept. of Veterinary Microbiology and Parasitology, Texas A&M University, College Station, Texas 77843, USA.

A granulomatous mesenteric mass containing numerous adult Lagochilascaris major was found in a raccoon near Houston, Texas. This is the first report of a Lagochilascaris in a species other than the opossum in North America.

FIGURE 1. Scanning electron micrograph of the head of an adult *Lagochilascaris major* 564 ×.

Journal of Wildlife Diseases, Vol. 16, no.1, January 198o.
3 figs., 7 references.

Authors abstract.



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Gunnar Jørgensen
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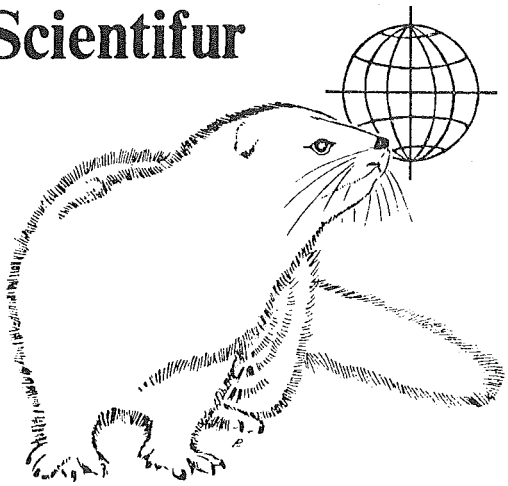

Published by
NJF's Fur Animal Division

BOOK REVIEW

Macdonald, D.W.: "Rabies and Wildlife - A Biologist's Perspective". Oxford University Press. 1980. 150 pages with 80 Tables and Illustrations.

The author is a biologist with special interest in ecology and centered on wild fox behaviour as vectors and victims of rabies.

Following a short introduction concerning the development of the disease and its impact on humans, the author describes the spread of the epizooty in Europe from its appearance at the Russo-Polish border in 1940 over its thrust to France and Italy - via the Federal Republic of Germany in the sixties - in the seventies. Conditions in France are treated in great detail (Chapters 1 - 3).

Chapter 4 on fox biology seen in the light of recent research is of greater practical importance to veterinary authorities concerned with control problems than to the veterinary practitioner, who encounters rabies in its domesticated form.

Against this background of fox biology, the author in Chapter 5 (41 pages) reviews various control measures. As shown in the book, the last problems have not yet been solved, and many of the questions raised remain unanswered for the time being.

Vectors other than foxes are mentioned in Chapter 6 (8 pages), and the final Chapter (23 pages) concerns itself with alternatives to mere extermination or decimation of a fox population such as, for example, oral vaccination through bait feed.

To the reader who is interested in the rabies syndrome, this small book is fascinating, and its up-to-date reference list offers possibilities of delving further into the subject, even though many printing errors disfigure the publication as a whole.

Bjørn Gierløff

Northwood Fur Farms, Inc.
P.O. BOX 40
CARY, ILLINOIS 60013

August 27, 1980

Mr. Gunnar Jorgensen
Scientifur
48 E. Roskildevej
DK-3400 Hilleroed
Denmark

Dear Gunnar:

In answer to your letter of the 13th of August, we can report some progress that we made in the use of electrolytes.

Our farm has consistently had good reproduction results at birth and our first day losses are moderate. However, in late May and early June, we ran into problems with the lactating ability of the females and we used to lose quite a few of them. In order to save kits, we had to do quite some farming out at that time which meant additional stress for the remaining females. This did not help the situation, either.

In 1979 we started using injectable electrolytes. This was done on a therapeutic basis and we looked for females that were off feed or had a lack luster appearance. We injected 10 cc in the abdominal cavity. The results were excellent and our losses of nursing females in 1979 were only a fraction of the previous year's. In 1980, we added electrolytes to the feed in a powder form. The dosage was .3% of the dry matter and we started in the beginning of May and fed it through June. We still use injectable, but the number of injections has been greatly reduced. Our losses of females in 1980 were a little higher than in 1979, but our kit crop exceeded the previous crop by 12% on the same amount of females.

Adding electrolytes to the feed in powder form was a direct result of the discussions we had in Vedbaek.

Yours truly,

A. A. Rietveld
Northwood Fur Farms, Inc.

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Shanghai 200062
People's Republic of China

Gunnar Joergensen
NJF's Fur Animal Scientifur
Editor-Scientifur
48 H Roskildevej
DK-3400 Hilleroed
Denmark

Sept 21, 1980

Dear Dr. Joergensen:

You will find enclosed manuscript entilted " Heat Production in the fur Chewing Chinchilla". Which I have written in English under my name and that of my colleauge. Hope it will be of interest to you and the researchers.

The journal yous requested is being sent by seperate cover. I have translate the tiales of original reports and titles of some articles, excluding rabbit, Karakul lamb, anf other miscellaneous. Any artiules you find special interesting you, please let me know, I will make a english abstract for you.

Please give Dr. Neil-Glem-Hanson our best regards, Thank him for his interesting reports and we appreciate it very much. Please tell him I will write to him later when we have the tables and figures fix and the explanation in english.

Yours, sincerely,

Lu Hogee.

Lu Hogee

JOURNAL OF RAISING FUR*BEARING ANIMAL
1980 No. 1.

Experiment and research section:

The postnatal development and the thermoregulation of the weasel. p.1-6.

The system anatomy of the mink. p.7-11.

Study of vitamin B deficiency in the mink. p. 12-15.

Breeding black cross mink. p. 16-18.

Studies of TRH to increase maternal mink yield and kit mink natality. p. 19-20.

TRH-- thyrotropin releasing factor.

Short note on chromosome observation of mink. p. 21.

The use of poly.IC (CIP* in the treatment of Aleutian disease in mink.

p. 22-23. CIP- polyinosinic acid-polycytidylic acid.

Technical interchange section:

The riasing and management of young mink. p. 29-31.

A study of self bite treatment in mink practice. p. 32-34.

Observations on the chinchilla mating behaviour. p. 35-36.

Translation section:

Communication

Journal Of Raising Fur-Bearing Animal

1980. No. 2.

Content

JOURNAL OF RAISING FUR-BEARING ANIMAL

1979. no. 4.

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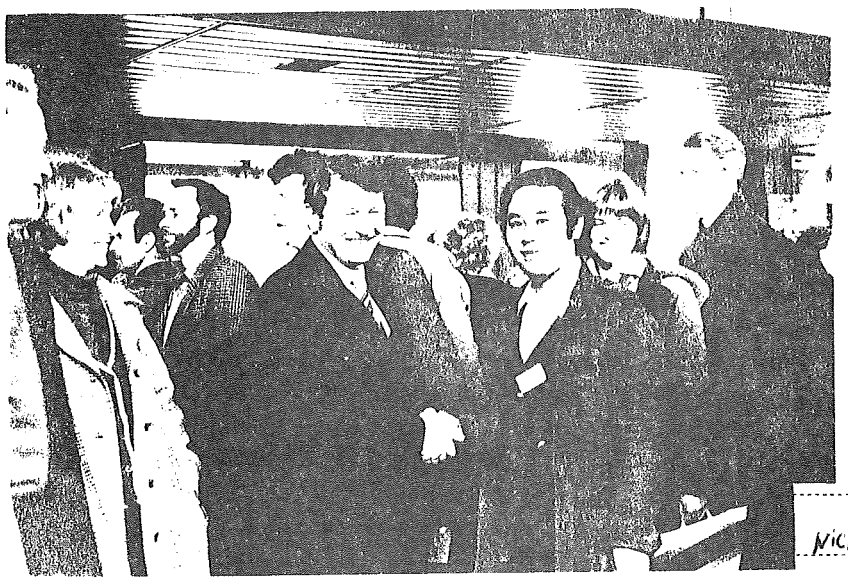

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Mr Gunnar Jørgensen
Scanfur,
48H Roskildevej
DK 3400 Hillerød

Dear Mr Editor:

I'm very grateful to you for your kind care of me while I was in Denmark.
I enclose a photograph, my friend took this in a air port.

I'm walking at English. Do you understand my broken English?

Yours sincerely
Koji Sugahara
菅原講二

P.S. You always comes out well, don't you?