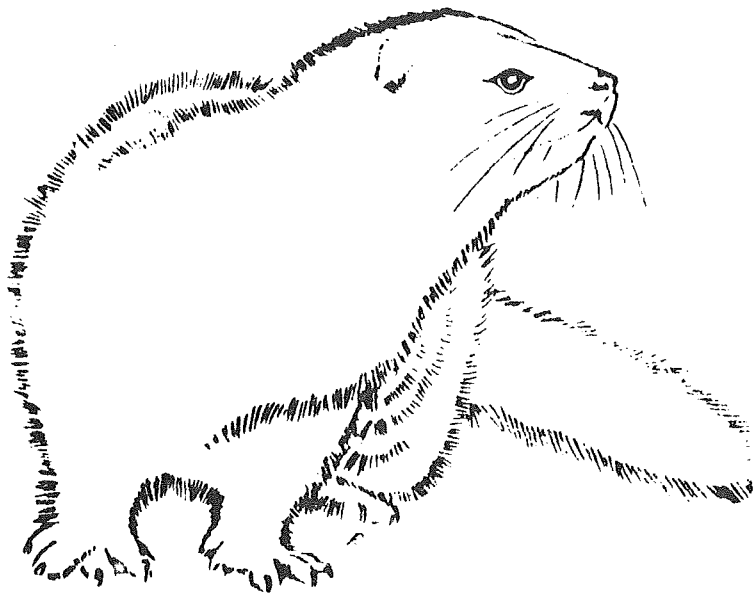


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8. COMMUNICATION

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CONGRESS CONCERNING GENETIC AND REPRODUCTION IN FUR
BEARING ANIMALS. Pietrozawodsk. 23-26th June 1981.
A correction.

THE YORK CONFERENCE 1982.

BOOK REVIEWS.

LABORATORY METHODS FOR EXAMINATION OF THE STATE
OF FUR-BEARING ANIMALS. V.A. Berestov.

BLOOD ENZYMES OF FUR-BEARING ANIMALS. V.A. Berestov,
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UNITED STATES-CANADIAN TABLES OF FEED COMPOSITION.
Nutritional data for United States and Canadian feeds.
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AN UPDATED BIBLIOGRAPHY OF THE CHEDIAK-HIGASHI SYN-
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LETTERS TO THE EDITOR.



Magic words.



N O T E S

SCIENTIFUR, VOL. 6, NO. 3, 1982.

It has been a very hot summer in Scandinavia this year. Perhaps this is the reason for not receiving details concerning the scientific Scandinavian meeting in Ålesund, Norway, which will take place from September 29 to October 1, 1982. Again we may ask those who are interested to contact the arrangement committee for further details. Address: Gudbrandt Loftsgaard, Norwegian Fur Breeders Association, Økern Torgveit 13, Oslo 5, Norway. Phone 00947-2224150.

We would like to thank all contributors to this issue of SCIENTIFUR. Especially the original reports makes us feel that the contacts are becoming more and more world wide and, so that the majority of scientific publications concerning fur animal production are presented in SCIENTIFUR.

This feeling is inspiring us in the daily work, and will very seldom give our relatively poor economy, which is based on a mere 310 paying subscribers, any thought. Naturally, we could hope for 500 subscribers, but it is still better - from an idealistic point of view - to produce a journal of which each issue is read by many interested people than it is to produce a greater number of issues that are not read at all.

Concerning the Index for SCIENTIFUR we can report that the work is going to be done, and we hope it can be ready by 1983.

The value of the scientific work cannot only be evaluated on basis of the academic standards, but also on the effect for further research or in the practical production.

Mr. Mick Hallam, editor of the British Fur Farmers Gazette, wish to ask the readers of SCIENTIFUR for material to include in the GAZETTE that will be useful for working mink- and fox farms. Please, help Mick and send you contributions direct to: Mick Hallam, editor, Janssen Services, 33a High Street, Chislehurst, Kent BR7 5AE, Great Britain.

Kind regards

Gunnar Jørgensen

Gunnar Jørgensen

Editor



"First of all, he wants to know where you intend to publish."

MULTIDISCIPLINARY

Original report.

CARDIOVASCULAR RESPONSE DURING SUBMERSION IN MINK (*MUSTELA VISON*) AND EUROPEAN FERRETS (*MUSTELA PUTORIUS FURO*).

James M. Ploucha and Richard J. Aulerich, Departments of Physiology and Animal Science, Michigan State University, East Lansing, MI 48824. U.S.A.

ABSTRACT:

Autonomic control of heart rate was examined in two carnivorous species in the same genus; the mink (*Mustela vison*), a natural diver, and the European ferret (*Mustela putorius furo*), a non-diver. The diving response of eight mink and eight ferrets was obtained by hand-held immersion of the head in 25°C water. Two 15 sec. (control) simulated forced dives were performed on each animal and two subsequent dives were conducted following pharmacologic blockade of sympathetic or parasympathetic control of heart rate. The heart rate of the mink and ferrets was reduced during immersion by 45 and 18%, respectively. The change in heart rate during diving in the mink was significantly ($P < 0.01$) greater than that of the ferrets. Mean arterial blood pressure was elevated during immersion in both species. The mink demonstrated a greater pre-dive and diving parasympathetic tone than the ferrets. These studies suggest mink exhibit a more pronounced diving bradycardia than ferrets.

INTRODUCTION:

There were two primary purposes for this study. First, inasmuch as the mink and ferret are becoming increasingly popular animals for toxicological and immunological research, we were interested in supplementing the scant literature concerning the autonomic control of the cardiovascular system in these species. Secondly, although these species are closely related phylogenetically, the mink is semi-aquatic and the ferret is primarily terrestrial. Hence, we were interested in determining if these different behaviors were associated with differing cardiovascular responses to immersion.

MATERIALS AND METHODS:

Eight adult male mink (1.57 ± 0.11 kg) and eight adult male ferrets (1.73 ± 0.04 kg) were obtained from the Michigan State University Experimental Fur Farm. The animals were reared in outdoor cages and had been maintained on a commercial mink ranch husbandry program. The animals were anesthetized with ketamine HCl (35 mg/kg i.m.) and a small low-cervical ventral mid-line incision was made by electrocautery. The left jugular vein was cannulated with polyethylene tubing for subsequent drug administration. The right common carotid

artery was cannulated with care not to damage the vagus nerve. This cannula was attached to a Statham transducer (PA-23AC) and a Grass 7A polygraph for monitoring arterial blood pressure. Heart rate (HR) was determined from the arterial pressure tracing. When the animals had partially recovered from the anesthetic, as indicated by an active righting reflex without response to toe pinch, the diving response was produced by hand-holding the animal horizontal and immersing the head in 25°C water for 15 sec. by head-down tilting. HR and mean arterial blood pressure (MABP) were averaged over the final 10 sec. of each dive.

Pre-dive and post-dive data were recorded during the head-down tilting without immersion immediately before and after immersion. Two dives were performed on each animal and two subsequent dives were performed following selective autonomic blockade. Sympathetic control of HR was blocked in half the animals by treatment with the beta-adrenergic antagonist propranolol HCl (2 mg/kg) and parasympathetic control of HR was blocked in the remaining animals by treatment with the cholinergic antagonist atropine sulfate (1 mg/kg). Propranolol treatment effectively eliminated the transient tachycardia induced by isoproterenol (1 µg in a 0.1 ml volume, intravenous) and atropine treatment eliminated the fall in MABP induced by acetylcholine chloride (4 µg in a 0.1 ml volume, intravenous). Autonomic blockade was challenged 20 min. following treatment and the two subsequent dives were performed at that time with 10 min. between dives.

The data were analyzed by the Students t-test and, when applicable, by the t-test for paired data.

RESULTS:

During immersion the mink and ferrets tended to relax and frequently exhaled. Representative blood pressure recordings obtained during 15 sec. dives are shown in Fig. 1. The MABP in both species increased within 1 to 2 sec. following immersion, and a prominent slowing of the heart rate, i.e. bradycardia, developed within seconds. During the dive the HR of the mink shown in Fig. 1 fell from 240 to 140 beats/min. The HR of the ferret shown in Fig. 1 fell from approximately 240 to 190 beats/min. during the dive. Following the dive, HR of the ferrets and MABP of the mink and ferrets quickly returned to pre-dive values. The cardiovascular responses to diving are summarized in Table 1. Control (untreated) mink showed a 45% reduction in HR and an 18% increase in MABP during immersion. HR in two of the mink fell to as low as 75 beats/min. HR in the untreated ferrets fell 19% while the MABP was increased 32% during immersion. While the change in HR of the mink during immersion was significantly ($P < 0.01$) greater than that of the

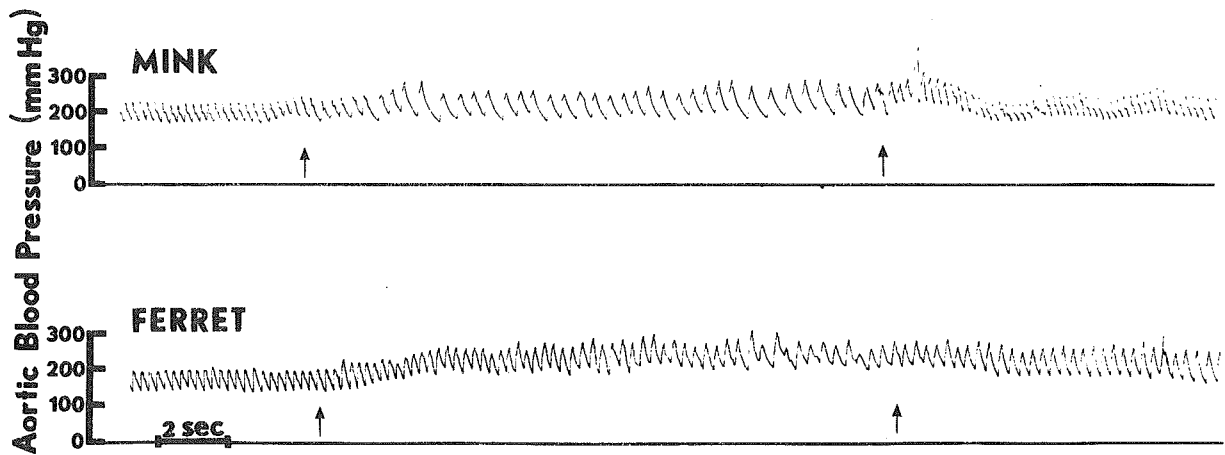


FIGURE 1. Responses to diving (head immersion) in a mink (top) and ferret (bottom). Onset and termination of diving are indicated by left and right arrows, respectively.

ferrets, the immersion-induced change in MABP was not significantly different between species. A post-dive tachycardia occurred in the mink but not the ferret.

Pre-treatment HR of the propranolol- and atropine-treated animals did not differ significantly. Propranolol treatment produced a 24 and 22% reduction in HR in the mink and ferrets, respectively, and a 21% fall in MABP in the ferrets only (Table 1). During the dives of the propranolol-treated animals, HR was reduced 40 and 10% in the mink and ferrets, respectively, and MABP was elevated in both species. While the change in HR during immersion of the mink was significantly ($P < 0.05$) greater than that of the ferrets, the immersion-induced change in MABP did not differ significantly between the species. A post-dive tachycardia occurred in the propranolol-treated mink but not in the ferrets. Post-dive and pre-dive values of MABP were not significantly different in either species.

Atropine pre-treatment produced a 61 and 18% increase in HR in the mink and ferrets, respectively. Atropine abolished the diving bradycardia, and MABP during the dive was increased 47 and 38% in the mink and ferrets, respectively. It was noted that the atropinized animals tended to struggle more than the non-treated or propranolol-treated animals during immersion. The post-dive HR and MABP of the atropinized animals were not significantly different from the pre-dive values.

TABLE 1. Cardiovascular responses of control, atropine-, and propranolol-treated mink and ferrets immediately before, during and after immersion.

	Mink			Ferrets		
	control	atropine (1 mg/kg)	propranolol (2 mg/kg)	control	atropine (1 mg/kg)	propranolol (2 mg/kg)
Heart rate, beats/min.						
Pre-treatment	231 ± 7 ^a	222 ± 16	240 ± 11	276 ± 6	279 ± 8	272 ± 10
Post-treatment	---	357 ± 17 ^b	193 ± 8 ^b	---	328 ± 9 ^b	221 ± 7 ^b
Dive	127 ± 11 ^b	355 ± 17	115 ± 15 ^c	215 ± 14 ^b	325 ± 7	200 ± 7 ^c
Post-dive	276 ± 15 ^b	368 ± 23	236 ± 15 ^c	265 ± 10	331 ± 6	202 ± 7
Mean arterial blood pressure, mmHg						
Pre-treatment	204 ± 13	175 ± 7	188 ± 6	170 ± 5	168 ± 9	172 ± 5
Post-treatment	---	175 ± 6	179 ± 5	---	162 ± 9	136 ± 5 ^b
Dive	240 ± 13	257 ± 18 ^c	217 ± 10 ^c	225 ± 8 ^b	224 ± 17 ^c	179 ± 6 ^c
Post-dive	196 ± 9	186 ± 9	188 ± 9	178 ± 5	166 ± 8	132 ± 5

^a Values are mean ± S.E. (8 dives in 4 animals) except control groups (16 dives in 8 animals).

^b Significantly different from pre-treatment value ($P < 0.05$).

^c Significantly different from post-treatment value ($P < 0.05$).

DISCUSSION:

It is well documented that all animals demonstrate bradycardia during submersion. The bradycardia is accompanied by peripheral vasoconstriction which effectively shunts the limited supply of oxygen to the heart and brain. Paul Bert's pioneer studies in 1870 on the physiology of diving led him to the conclusion that natural divers are better able to endure submersion than their terrestrial relatives and this is exemplified by the large variation in diving tolerances between terrestrial and semi-aquatic birds (Bond *et al.*, 1961) and mammals (Andersen, 1966). Although the mink and ferret are in the same genus, the mink is semi-aquatic (Dunstone, 1979) and preys extensively on fish in the wild (Akende, 1972; Day and Linn, 1972; Chanin and Linn, 1980), while the ferret is primarily terrestrial, feeding on small mammals, amphibians, and birds (Kaufman, 1980). In view of previous research, one would suspect that the mink might exhibit a more pronounced response to immersion than the ferret.

The pre-dive HR and MABP of the mink and ferrets used in this study were comparable to those reported in the literature (Emerson-Kemph and Chang, 1949; Hahn and Wester, 1969; Ringer *et al.*, 1974; Kohler and Bieniek, 1975). The mink demonstrated a greater pre-dive parasympathetic restraint on HR than the ferrets, as indicated by the three-fold greater effect of atropine on resting HR, and this may account for the lower resting HR in the mink. The mink also showed a more pronounced immersion-induced bradycardia. Inasmuch as the diving bradycardia was 99% eliminated by parasympathetic blockade with atropine, and was essentially unaffected by sympathetic blockade with propranolol, there is little

evidence supporting an attenuated sympathetic tone during the dive, as has been suggested to occur in the rat (Lin, 1974). The post-dive tachycardia in the mink was not affected by propranolol and, hence, appears to be related to changes in parasympathetic activation.

The mink and ferrets responded qualitatively similar in that, as in other animals, the diving bradycardia resulted from an elevation of parasympathetic restraint of the HR and deprivation of this bradycardia with atropine caused the animal to quickly become distressed. However, on a quantitative basis, the mink demonstrated a significantly ($P < 0.01$) more intense diving bradycardia than the ferrets. Thus, it appears that diving and non-diving species as closely related phylogenetically as the mink and ferret can demonstrate considerable differences in the intensity of the cardiovascular response to immersion.

ACKNOWLEDGEMENTS:

This research was supported, in part, by National Institutes of Health Grants HL/AM-24363 and HL-10879 and is published with the approval of the Michigan Agricultural Experiment Station as Journal Article No. 10163.

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SCIENTIFUR code: 2-3-M-0.

THE EFFECTS OF ADDED IODINE AND FISHMEAL ON THE REPRODUCTION AND GROWTH OF MINK (MUSTELA VISON).

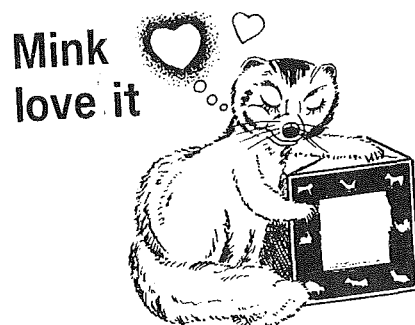
Ross Edward Jones, Michigan State University.

In a screening test, rats fed diets supplemented with 40 percent fishmeal had fewer liveborn pups and fewer pups at weaning than unsupplemented controls. When mink were fed a diet supplemented with 30 percent fishmeal, kit survival to weaning was significantly reduced. Groups of mink were fed diets containing 0, 10, 20, 40, 80 or 160 ppm of supplemental iodine for 8 months prior to mating, and were given 40, 80, 160 or 320 ppm for 1 month prior to mating. All groups continued on the pre-mating diets throughout gestation and lactation. Levels of approx. 100 ppm iodine tended to decrease litter size at birth and at weaning.

SCIENTIFUR code: 6-3-5-M.

Dissertation abstracts International, B: 41 (7), 2404, 1981.

CAB-abstract,



URATE NEPHROLITHIASIS IN RANCH MINK.

Michael J. Tomlinson, Victor Perman, Robert L. Westlake, Veterinary Diagnostic Laboratory, College of Veterinary Medicine, Univ. of Minnesota, St. Paul, MN 55108, USA.

Urate nephrolithiasis with epistraxis and bleeding around foot pads was diagnosed in ranch mink. Investigation of affected, unaffected-related, and unaffected-unrelated mink did not disclose the cause of these problems but did eliminate inherited bleeding disorders as a cause of the bleeding. All affected mink were males, had been sired by related sires, and were affected in the 1st year of life. Elimination of affected mink and their parents from the breeding stock eliminated the condition from the herd. The findings were consistent with an inherited defect in uric acid metabolism or excretion.

SCIENTIFUR code: 4-9-M.

Journ. of Amer. Vet. Med. Ass., Vol. 180, no.6, 622-626, 1982.

3 figs., 4 tables, 11 references.

Authors' summary.

ELECTROHYDRAULIC STERILIZATION OF MEAT FEEDS AS A METHOD OF PREVENTION OF TRICHINELLOSIS AND OTHER INFECTIONS IN ANIMALS.

A.V. Uspensky, A.S. Bessonov, N.V. Shekhovtsov, The All-Union K.I. Skryabin Institute of Helminthology, Moscow, USSR.

One of the methods of prevention of trichinellosis is boiling of meat wastes used for feeding of animals.

Boiling of kitchen and abattoir wastes has a number of drawbacks: it needs a great expenditure of energy, it lowers the biologic value of animal food, and it does not give full extraction of bone fat or full sterilization of food, which can cause spreading of dangerous diseases.

The mentioned drawbacks can be eliminated during treatment of meat wastes in an electrohydraulic (EH) apparatus ensuring sterilization of food, its preservation of biologic properties of uncooked meat, and fine grinding of bones and other hard tissues. In our tests we used the apparatus "EHOM" with an output of 500 kg of food per hour.

Conclusions.

1. Electrohydraulic treatment of meat foods is an effective preventive method for trichinellosis and Aujeszky's disease.
2. EH treatment allows the preservation of biologically valuable components, and improves gustatory and nutritious characteristics of meat foods.
3. Feeding of fur animals with EH-treated foods increases productivity of the animals.
4. Usage of the new technology avoids labour-consuming operations, shortens the duration of treatment and decreases the expenditures for preparing foods.

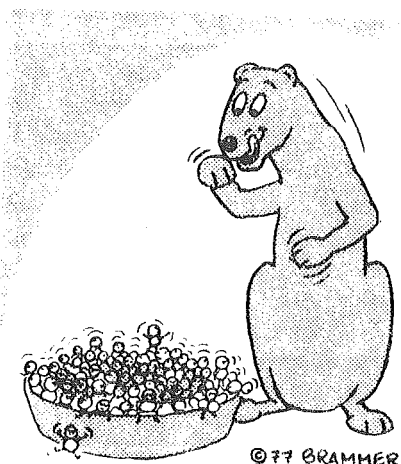
SCIENTIFUR code: 7-8-M-F.

Publ.: Chertsey, Surrey, UK; Reedbooks Ltd. Trichinellosis. Proceedings of the 5th International Conference on Trichinellosis, 1-5 Sept. 1980, Noordwijk Aan Zee, the Netherlands. (Edited by: Kim, C.W., Ruitenbergh, E.J.; Teppema, J.S.) Part of a collective document, in this document it is page 415-417, 1981.

In English.

7 references.

Abstract: G. Jørgensen



I hope we shall have
EH-treated feed tomorrow!

EFFECT OF DOMESTICATION ON THE MORPHOFUNCTIONAL STATE OF
THE ADRENAL CORTEX IN SILVER FOXES IN DIFFERENT PERIODS
OF THE POSTNATAL DEVELOPMENT.

ВЛИЯНИЕ ДОМСТИКАЦИИ
НА МОРФОФУНКЦИОНАЛЬНОЕ СОСТОЯНИЕ
КОРЫ АДНОЧЕЧНИКОВ
У СЕРЕБРИСТО-ЧЕРНЫХ ЛИСИЦ
В РАЗЛИЧНЫЕ ПЕРИОДЫ ПОСТНАТАЛЬНОГО РАЗВИТИЯ

N.S. Lutsenko, Izvestiia Sibirskogo Otdeleniia Akademii Nauk SSSR.
Novosibirsk.

Clear-cut differences taking place under the influence of domestication have been found during morphological of the adrenal cortex in relatively wild and tame silver foxes.

In domesticated animals a decrease in the functional activity of zona fasciculata and increase in the reticular function were seen.

SCIENTIFUR code: 2-3-11-F.

Izvestiia Sibirskogo Otdeleniia Akademii Nauk SSSR, Seriiia Biologicheskikh Nauk (Novosibirsk, "Nauka", Aug. 1980, 1, 94-98. ISSN: 0568-6547.

1 table, 2 figs., 6 references.

In Russian with English abstract.

Author's abstract.

FUNCTIONAL ACTIVITY OF THE HYPOTHALAMO-HYPOPHYSIAL
NEUROSECRETORY SYSTEM IN AUTUMN IN FOXES WITH DIFFERENT
DETERMINED BEHAVIOUR.

ФУНКЦИОНАЛЬНАЯ АКТИВНОСТЬ
ГИПОТАЛАМО-ГИНОФИЗАРНОЙ
НЕПРОСЕКРЕТОРНОЙ СИСТЕМЫ
В ОСЕННИЙ ПЕРИОД У ЛИСИЦ
С РАЗЛИЧНЫМ ДЕТЕРМИНИРОВАННЫМ ПОВЕДЕНИЕМ

M.N. Yurissova, L.N. Ivanova, Izvestiia Sibirskogo Otdeleniia Akademii Nauk SSSR, Novosibirsk.

A cytomorphological analysis of the peptidergic gomori-positive hypothalamo-

hypophysial neurosecretory system and of monoaminergic arcuate nucleus (AN) was carried out in silver foxes. In November, out of the reproductive season, a tendency to a suppression of the functional activity of neurosecretory, glial and vascular components of the median eminence and also of AN nervous cells in tame male foxes, younger than one year, was seen in comparison with aggressive animals. This difference increases till a significant one in adult females. In the process of the selection for domestication the activity of the control link of the regulation of adeno-hypophysial functions becomes, evidently, suppressed.

SCIENTIFUR code: 11-3-F.

Izvestiia Sibirskogo Otdeleniia Akademii Nauk SSSR. Seriiia Biologicheskikh Nauk. (Novosibirsk, "Nauka". 1. Aug. 1980 (2). 99-102. ISSN: 0568-6547.

1 table, 10 references.

In Russian with English abstract.

Authors' abstract.

COMPOSITION OF MILK OF THE SEA OTTER (*ENHYDRA LUTRIS*).

Robert Jenness, Thomas D. Williams, Robert J. Mullin, Dept. of Biochemistry, University of Minnesota, St. Paul MN 55108, USA.

1. Milk specimens from 5 wild and 2 captive sea otters, *Enhydra lutris*, were analyzed for pH, gross composition and calcium, phosphate and citrate. Osmolality of two samples was determined.
2. The pH is lower and osmolality higher than in milks of other species examined.
3. Milks of wild sea otters have the high fat, low lactose composition characteristic of other marine mammals such as pinnipeds and cetaceans.
4. The samples from captive animals differed markedly in composition from those of the wild animals.
5. The fatty acid composition of *Enhydra* milk fat is characterized by high contents of palmitic, oleic long chain polyunsaturated acids.
6. *Enhydra* caseins and whey proteins each consist of several protein entities.

SCIENTIFUR code: 16-0.

Comp. Biochem. Physiol., Vol. 70A, 375-379, 1981.

3 tables, 2 figs., 18 references.

Authors' abstract.

SURGICAL EXTIRPATION AND RELATED ANATOMY OF ANAL SACS
OF THE FERRET.

J.E. Creed, R.A. Kainer, Dept. of Clinical Sciences, College of Vet. Med.
and Biomedical Science, Colorado State University, Fort Collins,
CO 80523.

The ferret (*Mustela putorius furo*) is becoming a popular household pet, but the odor from its anal sacs is objectionable. As with nearly all carnivores and in all mustelids, the ferret has an anal sac on each side of the anus. The ducts open at 4- and 8- o'clock positions on the inner cutaneous zone of the anus, adjacent to the mucocutaneous junction. A glandular complex surrounding the duct of each anal sac has been described in mink. Both sebaceous and apocrine tubular glands discharge their secretions into the duct. Surgical extirpation of the anal sacs and their ducts will eliminate the odor of the anal sac secretions, but some odor from sebaceous and apocrine tubular glands in the perianal region may remain.

Results and Discussion.

Though no serious sequelae to surgery have been observed in 25 cases, complications can occur. The novice may cut accidentally into the lumen of the duct or the sac. While the odor is obnoxious, surgical extirpation can still be accomplished, although absence of a distended sac makes surgery more tedious. Familiarity with the surgical procedure will minimize this problem. Postoperatively, some persistent minor hemorrhage may occur, but this has ceased spontaneously in all cases. Potential postoperative complications include prolapsed rectum and/or fecal incontinence due to excessive trauma to the anal sphincter muscles. Staying on the proper fascial plane will ensure less trauma and minimize the possibility of these serious sequelae. Mild odor following surgical extirpation of the anal sacs may persist, since well-developed sebaceous and apocrine tubular glands are present in the cutaneous zone of the anus and perianal skin, and clients should be so advised.

SCIENTIFUR code: 2-16-0.

JAVMA, Vol. 179, No.6, 575-577. 1981.

5 figs., 5 references.

Authors' introduction and
discussion.

A TECHNIQUE FOR EXCAVATING RED FOX DENS.

Louis T. Berchielli, Benjamin F. Tullar, Angelica B. Leubner, New York State Department of Environmental Conservation, Wildlife Resources Center, Delmar, N.Y. 12054.

A method for excavating red fox dens with the aid of a wire ferret and net bags is described. A total of 72 dens were located and excavated on a 100-square mile area in Central New York, and nine adult females and 225 pups were captured, a few more than once. A mean of 4.5 fox pups were captured per successful excavation. Dens were reconstructed after being excavated, and there was no significant difference between the rate of reoccupation for excavated and unexcavated dens. Because of the contagious and fatal nature of sarcoptic mange in red foxes, a strict procedure was developed to completely decontaminate or replace all tools and other equipments used.

SCIENTIFUR code: 14-F.

New York Fish and Game Journal, Vol. 28, no.1, January 1981. 40-48.

2 tables, 1 fig., 32 references.

Authors' abstract.

HAIR FINENESS IN CHINCHILLAS.

(Über die Haarfeinheit bei Chinchillas).

Ulrich Ebert, Universität Giessen,

Approximately 27,000 hairs from 67 chinchillas were investigated. Hairs on the side and belly were significantly finer (10.9 and 11.01 μm resp.) than those on the back and neck (12.07 and 12.09 μm). Males tended to have finer hairs than female, and animals from small litters had finer hairs than those from large litters. There were significant differences between colour types, with beige, black velvet and pastel velvet chinchillas having the finest and white and standard chinchillas the thickest hairs. Males had a more uniform coat than female, and the pelts of black velvets were significantly more uniform than those of other colour types. There

was a significant correlation of 0.62 between hair fineness and pelt uniformity.

SCIENTIFUR code: 2-0.

Deutsche Pelztierzuchter, 55 (8), 136-138, 1981.

In German.

CAB-abstract.



**ULTRASTRUCTURAL OBSERVATION OF PARACRYSTALLINE AGGREGATES
OF MICROTUBULES IN ANTERIOR PITUITARY CELLS OF THE CHINCHILLA
(CHINCHILLA LANIGER).**

Masataka Shiino, Dept. of Anatomy, The University of Texas Health Science Center at San Antonio, 7703 Floyd Curl Drive, San Antonio, Texas USA.

Unusual paracrystalline aggregates of microtubules which have not been described in any other mammalian species were observed in cultured anterior pituitary cells of normal chinchillas as well as in situ in the pituitary glands of these animals. These aggregates appeared as regularly arranged tubular structures in the longitudinal plane, and as a checkerboard pattern of closely and regularly packed microtubules when examined in transverse section. Supplementation with vinblastine, colcemide or colchicine in the culture medium did not change these structures morphologically. Each unit of tubules consisted of an outer wall or parallelogram profile and an inner wall composed of a single hexagonal doublet or in a figure "8" form. The outer wall of the parallelogram was 35x28 nm in length for both sides, while the diagonal of the inner wall was 18x28 nm. These paracrystalline aggregates of microtubules in the chinchilla pituitary cells are morphologically distinct from the paracrystalline assembly of cytoplasmic microtubules induced by vinblastine or other alkaloids.

The function and significance of these paracrystalline aggregates in anterior pituitary cells of the chinchilla are uncertain.

SCIENTIFUR code: 2-0.

Cell Tissue Res. 213, 433-440, 1980.

7 figs., 13 references.

Author's summary.

PRESENT DAY PROBLEMS IN THE REARING OF CHINCHILLA
IN YUGOSLAVIA.

Aktuelni problemi uzgoja cincila u Jugoslaviji).

J. Jurgec, dipl. veterinar, Ljubljana, Jugoslavia.

Organized rearing of chinchillas started in Yugoslavia in 1970 with the setting up of a merged company "Yugo-Chinchilla-Botessini". It was founded by "Agraria" from Koper in collaboration with the Italian firm "Botessini" from Palmanova. Occasional cases were known before that time.

Chinchillas are kept in cages of different dimensions under different systems. They are put in several layers against the wall or according to the flatdeck system in an acclimatized room.

Many problems arose during the work of chinchilla breeders especially with young animals and in the obtaining of high quality pelts.

The successful rearing of the many offspring depends on the correctness of nutrition. Experience showed that pellets produced in this country were deficient in vitamins and essential amino acids, while the lack of cellulose fibre was particularly large. Besides the small number of reared offspring there were consequences in damage to the fur.

The aim of keeping chinchillas is to produce high quality furs. Poor and damaged pelts occur often because of the weak genetic potential of the parents, since degeneration and inherited disturbances are passed on to the progeny together with colic. Further defects happen because of the lack of vitamins, essential amino acids and minerals in the feed. Very great damage to the fur appears with dermatophytis.

Together with the enumerated problems, an account of the profitability of rearing chinchillas on the basis of fur production is presented. A facultative combination of obtaining furs together with the sale of high-quality breeding stock is given.

According to the opinion of the keepers of chinchillas, the greatest problem in this country is that Yugoslav commerce has not accepted fur and enabled it to attain the importance which, from its high-quality, it deserves.

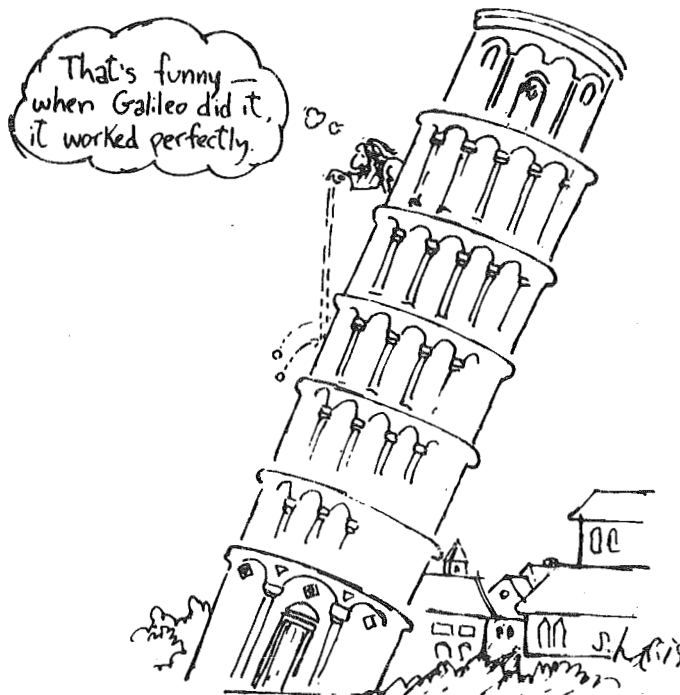
SCIENTIFUR code: 12-0.

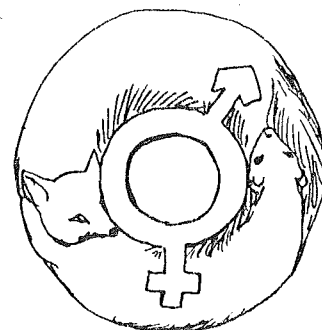
Vet. glasnik 35, 7, 695-701, 1981.

2 tables, 16 references.

Author's summary.

In Yugoslavian with summaries in English and Russian.





GENETICS

AMERICAN MINK GENE MAPPING.

I. CHROMOSOMAL ASSIGNMENT OF MINK Ldh A, Ldh B, and Gpi LOCI.

КАРТИРОВАНИЕ ХРОМОСОМ АМЕРИКАНСКОЙ НОРКИ СООБЩЕНИЕ I. ОПРЕДЕЛЕНИЕ ХРОМОСОМНОЙ ЛОКАЛИЗАЦИИ ЛОКУСОВ Ldh A, Ldh B и Gpi У АМЕРИКАНСКОЙ НОРКИ

N. B. Rubtzov, S.I. Radjabli, A.A. Gradov, O.L. Serov, Inst. of Cytology and Genetics, Academy of Science of the USSR, Siberian Division, Novosibirsk.

Somatic cell hybrids between American mink cells (fibroblasts, leukocytes, bone marrow cells) and Chinese hamster cells (M-15-1) were analyzed by starch-gel electrophoresis for the expression of mink glucosophosphate isomerase, lactate dehydrogenase-A and lactate dehydrogenase-B. The data obtained demonstrate that genes coding for mink glucosephosphate isomerase and lactate dehydrogenase-A are linked to mink chromosome 7, and the gene coding for mink lactate dehydrogenase-B is linked to mink chromosome 9.

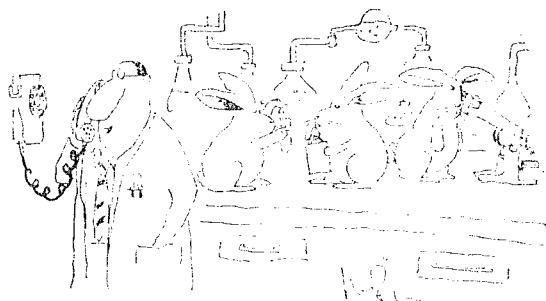
SCIENTIFUR code: 4-3-M.

Genetica, USSR, 17, 10, 1856-1861, 1981.

3 tables, 3 figs., 14 references.

In Russian with English summary.

Authors' summary.



"Oh, nothing much. Just experimenting with some rabbits."

Drawing by Levin 1980
The New Yorker Magazine

AMERICAN MINK GENE MAPPING.

II. CHROMOSOMAL ASSIGNMENT OF MINK *Mod-1*, *Mor-1*, AND *Idh-1* LOCI.

**КАРТИРОВАНИЕ ХРОМОСОМ АМЕРИКАНСКОЙ ПОРКИ
 СООБЩЕНИЕ II. ОПРЕДЕЛЕНИЕ ХРОМОСОМНОЙ ЛОКАЛИЗАЦИИ
 ЛОКУСОВ *Mod-1*, *Mor-1* и *Idh-1* У АМЕРИКАНСКОЙ ПОРКИ**

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

Evidence is presented for the assignment of the genes for malate dehydrogenase, NADP-1 malate dehydrogenase, NAD-1 and isocitrate dehydrogenase-1 to mink chromosomes 1, 11 and 4, respectively.

SCIENTIFUR code: 4-3-M.

Genetica, USSR, 17, 10, 1862-1866, 1981.

4 tables, 12 references.

In Russian with English summary.

Authors' summary.

**CHINESE HAMSTER × AMERICAN MINK SOMATIC CELL HYBRIDS:
 CHARACTERIZATION OF A CLONE PANEL AND ASSIGNMENT OF THE MINK
 GENES FOR MALATE DEHYDROGENASE, NADP-1 AND MALATE
 DEHYDROGENASE, NAD-1.**

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

Chinese hamster × American mink somatic cell hybrids were obtained and examined for chromosome content and expression of mink malate dehydrogenase, NADP (MOD-1; EC 1.1.1.40), malate dehydrogenase, NAD (MOR-1; EC 1.1.1.37), glucose-6-phosphate dehydrogenase (G6PD; EC 1.1.1.49) and hypoxanthine phosphoribosyltransferase (HPRT; EC 2.4.2.8). All the hybrid clones examined were found to segregate mink chromosomes. A clone panel containing 25 clones was set up. The possibilities and limitations of this

panel for mink gene mapping are analysed. Using this panel, it is feasible to rapidly map genes located on chromosomes 1-13 and to provisionally assign genes located on chromosome 14 and the X. Based on the data obtained, the genes for MOD-1 and MOR-1 were firmly assigned to mink chromosomes 1 and 11, respectively, and the genes for G6PD and HPRT were provisionally assigned to the X.

SCIENTIFUR code: 4-3-M.

Theor. Appl. Genet. 60, 99-106, 1981.

6 tables, 7 figs., 21 references.

In English.

Authors' summary.

**IMMUNOGENETIC STUDY ON THE POLYMORPHISM OF SERUM
 α_2 -LIPOPROTEINS IN MINK.
IV. DIALLELISM AT THE Ld LOCUS OF LOW-DENSITY LIPOPROTEIN.**

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

Antibodies against a new allotype, Ld2, of mink low-density lipoprotein (LDL) were obtained by alloimmunization with a preparation of this lipoprotein. The two known allotypes of LDL, designated Ld1 and Ld2, are coded for by codominant alleles of the autosomal Ld locus. This locus is probably involved in the genetic control of the whole serum pool of LDL molecules. In Ld1/Ld2 heterozygotes, LDL is represented by two homozygous types of molecules, Ld1 and Ld2; it has no hybrid molecules bearing both allotypic specificities together. The results suggest that the Ld locus has, presumably, only two alleles in the mink populations studied. Mink LDL having allotypes Ld1 and Ld2 was found to be homologous to human and pig LDLs. Antigenic specificity of Ld1 allotype was established in the sera of a wide phylogenetic range of mammals and in the human LDL. The parallelism between the phylogenetic antiquity of the Ld1 gene and its high frequency in mink and other species may be attributed to the selective value of this gene, which has been retained unaltered during macroevolution.

SCIENTIFUR code: 4-3-M.

Biochemical Genetics, Vol. 19, Nos. 9/10, 1981.

4 tables, 8 figs., 36 references.

In English.

Authors' summary.

**INTERSPECIFIC DISTRIBUTION OF ALLOTYPIC MINK
(MUSTELA VISON) IgG ANTIGENS.**

O.K. Baranov, I.I. Fomicheva, D.V. Ternovsky, J.G. Ternovskaya,
Institut of Cytology and Genetics, Biological Institute, Academy
of Sciences of the USSR, Siberian Branch, Novosibirsk, 630090, USSR.

The antigenic specificities of six (1-6) IgG allotypes of the domestic mink were tested in the sera of closely related species of Mustelidae family and distant mammalian species. It was found that allotypes 1 and 5 are ancient. Their antigenic specificities were established not only in Mustelidae, but also in other taxonomic orders of mammals. Allotypes 3 and 2 are phylogenetically younger; they were detected only in Mustelidae. Allotypes 4 and 6 appear to be unique to the domestic mink.

The instantaneous evolutionary emergence of complex allotypes 4 and 6 is difficult to explain by a rapid accumulation of gene point mutations during phylogenesis. Activation in the domestic mink of those immunoglobulin genes, which are silent or poorly expressed in closely related Mustelidae, is suggested as a more plausible explanation.

SCIENTIFUR code: 4-3-M.

Journ. of Immunogenetics, 1981, 8, 249-256.

2 tables, 3 figs., 28 references.

In English.

Authors' summary.

**DEVIATION FROM EXPECTED FUR COLORATION SEGREGATION IN COLOUR
HETEROZYGOUS MINK PROGENY.**

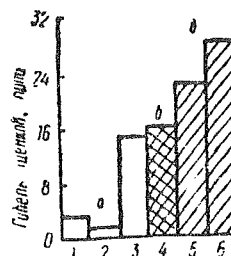
**ОТКЛОНЕНИЕ ОТ ОЖИДАЕМОГО РАСЩЕПЛЕНИЯ
ПО ОКРАСКЕ МЕХА В ПОТОМСТВЕ ЦВЕТНЫХ
ГЕТЕРОЗИГОТНЫХ НОРОК**

Yu. V. Vagin, USSR.

Of 1346 progeny of sapphire (ppAa) x silverblu (ppAa) matings carried out over 4 consecutive years, only 34.2 percent were of the sapphire phenotype, significantly fewer than the 50 percent expected. Each of the 4

yr showed a significant deficiency of sapphire kits. Of 643 progeny of ppAa × ppAa matings carried out over the same period, 18.5 percent were ppAa, significantly less than the 25 percent expected. The difference was significant in 2 of the years. The number of kits produced per mated female was, on average, 0.3 higher for sapphire female progeny of ppAa dams than for sapphire female with ppAa dams.

Дифференциальная гибель щенков в период эпизоотии чумы.
Генотипы родителей:
1 — ♀♀ ppAa × ♂♂ ppAa; 2 — ♀♀ ppAa × ♂♂ ppaа; 3 — ♀♀ ppaа ×
× ♂♂ ppaа; 4 — ♀♀ ppAA × ♂♂ ppAA; 5 — ♀♀ ppAA × ♂♂ ppaа; 6 —
♀♀ ppAa × ♂♂ ppaа. Генотипы щенков: а — ppaа; б — ppAA; в —
ppAa.



SCIENTIFUR code: 4-M.

Tsitologiya i Genetika, 13, 3, 221-227, 1979.

5 tables, 1 fig., 14 references.

In Russian with English summary.

CAB-abstract.

PHYLOGENETIC ANALYSIS OF IgG ALLOTYPES OF THE AMERICAN MINK.

O.K. Baranov, I.I. Fomicheva, D.V. Ternovskii, Yu. G. Ternovskaya,
Institute of Cytology and Genetics, Siberian Branch, Academy of
Sciences of the USSR, Novosibirsk, 630090, USSR.

The genetic polymorphism of immunoglobulins of the American mink has now been detected in the form of six (1-6) alloantigenic markers of the IgG class. In this work we undertook to obtain information on the evolution of this allotypic polymorphism. Blood sera of the species of martens most closely related to the American mink were studied. In addition to the martens, we also analyzed the sera of representatives of other families and orders of mammals.

In the work we used monospecific mink alloantisera of each of the six allotypes (anti-1, anti-2, etc.). The data obtained are summarized in Table 1.

The results obtained permit us to conclude that the antigenic specificities (and the corresponding gene mutations) of allotypes 1 and 5 of the American mink arose in evolution before the separation of the investigated species of the marten family. Moreover, they are both detected in representatives of another family of the order of carnivores (dogs and foxes), while the specificity 1, moreover, is detected in mammals of various orders. Thus, the genetic information for antigen 5 has a great phylogenetic "age", as a minimum equal to the time elapsed since the separation of Canoidea from Feloidea. For antigen 1 this age is evidently even more substantial.

SCIENTIFUR code: 4-M-0.

New York, Consultants Bureau. July-Aug. 1980 (publ. 1981) Vol. 253 (1/6) 353-355. ISSN: 0012-4966.

Translated from Doklady Akademii Nauk SSSR, Vol. 253, No.6, 1474-1476. August 1980.

1 fig., 12 references.

In English.

Abstract: Gunnar Jørgensen.

THE CHROMOSOMES OF THE CANADIAN BEAVER CASTOR CANADENSIS.

Fernande B. Genest, Pierre Morisset, Robert P. Patenaude, Dept. de biologie, Faculté des sciences et de génie, Université Laval, Quebec, G1K 7P4, Canada.

A chromosome analysis of 24 Canadian beavers, *Castor canadensis* Kuhl (12 males and 12 females), captured in Laurentides Park, Quebec, has been performed from preparation of blood lymphocyte and skin cultures. The chromosome number was found to be $2n = 40$. Measurements were made to determine relative lengths and arm ratios of chromosomes, which are metacentric or submetacentric. Results are in agreement with those already published regarding the chromosome number, but differ in the identification of the X chromosome, and in the morphology of the Y and some autosomes. C- and G-banding techniques allowed the precise identification of individual chromosome pairs. A detailed idiogram of G-bands is presented.

SCIENTIFUR code: 4-0.

Can. J. Genet. Cytol. 21, 37-42, 1979.

1 table, 4 figs., 9 references.

Authors' summary.

In English with summaries in English and French.



REPRODUCTION

OBSERVATIONS ON THE INDUCTION OF OVULATION AND EXPULSION OF UTERINE EGGS IN THE MINK, *MUSTELA VISON*.

C.E. Adams, A.R.C., Institute of Animal Physiology, Animal Research St.,
307 Huntingdon Road, Cambridge CB3 0JQ, U.K.

In 8 of 12 mink paired for the first time, pairing alone induced ovulation and a short (5 min) interrupted mating led to 8/8 ovulating with normal numbers of corpora lutea. However, in already mated mink, a short mating (Day 7) failed completely or partly (reduced number of ovulations) to induce ovulation. In mink which refused to mate, hCG consistently induced ovulation.

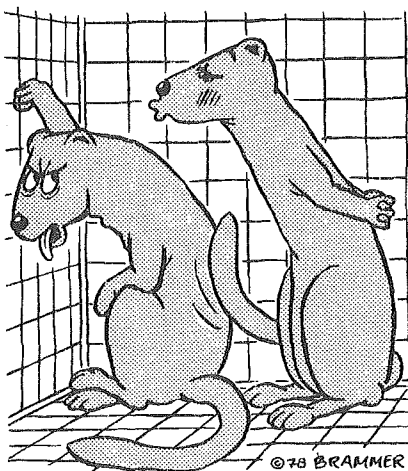
In already mated mink (Day 0) a later mating (Day 7), even if interrupted after 5 min, led to expulsion of the first set of eggs, approximately 50% of which were 'lost' by Day 4 and virtually 100% by Day 6. This effect was not produced by pairing without intromission or by treatment with hCG to induce ovulation. It is concluded that copulation is primarily responsible for the loss of eggs from the uterus, although the exact mechanism remains obscure.

SCIENTIFUR code: 5-M.

J. Reprod. Fert. 1981, 63, 241-248.

14 references.

Author's summary.



I am sorry, my dear,
Dr. Adams cannot do
the whole work !

PROLACTIN: THE HYPOPHYSEAL FACTOR THAT TERMINATES
EMBRYONIC DIAPAUSE IN MINK.

Bruce D. Murphy, Patrick W. Concannon, Hugh F. Travis, William Hansel,
Dept. of Biology, University of Saskatchewan, Saskatoon,
Saskatchewan, Canada, S7N 0W0.

The purpose of this experiment was to determine whether prolactin (PRL) is the factor that activates the quiescent corpus luteum (CL) and terminates the delay that precedes implantation in mink. Animals were hypophysectomized or sham-hypophysectomized 6 days after the second of two matings. Eight hypophysectomized mink received 0.5 mg ovine PRL (NIH-P-S1 3) daily through Days 21-24 of the experiment (Day 0 = day of surgery). Five sham-hypophysectomized and one hypophysectomized animal received no hormone therapy after surgery. All animals were bled at 3 day intervals until termination by exsanguination between Days 21 and 24. Uteri were observed by means of midventral laparotomy between Days 14 and 16.

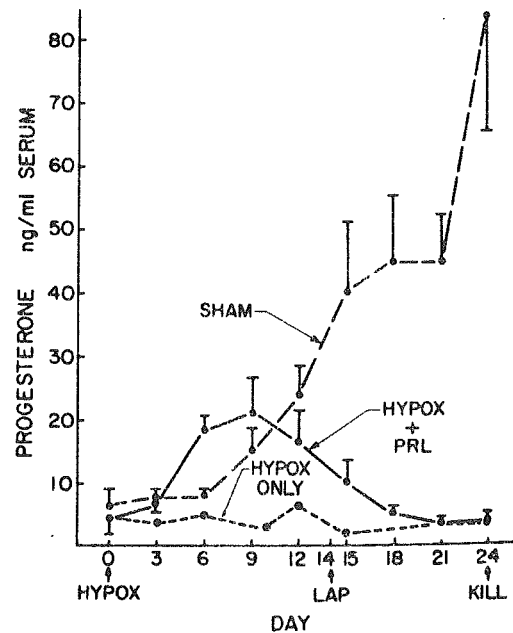


FIG. 1. Mean progesterone levels in serum from hypophysectomized mink receiving no further treatment (HYPOX ONLY), injected with 0.5 mg ovine PRL/day (HYPOX + PRL), or sham-hypophysectomized mink (SHAM). Animals were bled by heart puncture at 3 day intervals following surgery, laparotomies (LAP) were performed between Days 14-16, and animals were killed between Days 21-24.

The hypophysectomized, untreated mink displayed neither luteal activation nor embryo implantation throughout the duration of the experiment. In hypophysectomized mink injected with PRL, luteal activation, as indicated by an increase in peripheral progesterone above pretreatment levels, had begun by Day 3 and persisted through Day 15 ($P < 0.05$). Uterine swellings were present in six of eight PRL-treated mink at Day 14-16 and in seven of eight at Days 21-24. These swellings were found to contain implanted embryos at necropsy. Luteal activation occurred by Day 9 in sham-hypophysectomized mink, and progesterone continued to increase through Day 24. No evidence of implantation was present at Days 14-16 in this group but three of five had implanted by Days 21-24.

The results demonstrate that PRL alone will induce luteal activation and embryo implantation in hypophysectomized mink. However, PRL alone appeared not to be able to sustain luteal function. It is suggested that photoperiod acts through hypophyseal PRL secretion to terminate embryonic diapause in mink.

SCIENTIFUR code: 5-3-M.

Biology of Reproduction, 25, 487-491. 1981.

1 fig., 23 references.

Authors' abstract.

CHANGES IN FSH AND LH SECRETION IN THE FERRET ASSOCIATED WITH THE INDUCTION OF OVULATION BY COPPER ACETATE.

B.T. Donovan, B. Gledhill, Dept. of Physiology, Inst. of Psychiatry,
De Crespigny Park, London SE5 8AF, England, U.K.

The changes in FSH and LH Secretion associated with the induction of ovulation by i.v. injection of 5 mg copper acetate were followed in the ferret and found to be influenced by barbiturate anesthesia. In anesthetized estrous animals, the metal ion produced a small initial increase in plasma LH concentration which was followed by a gradual but sustained rise. Anestrous animals responded with a large initial surge of LH release which declined to a plateau some 4 times higher than the basal level and was maintained for at least 6 h. Compared with the anesthetized animals, treatment of conscious estrous ferrets with copper acetate caused an abrupt

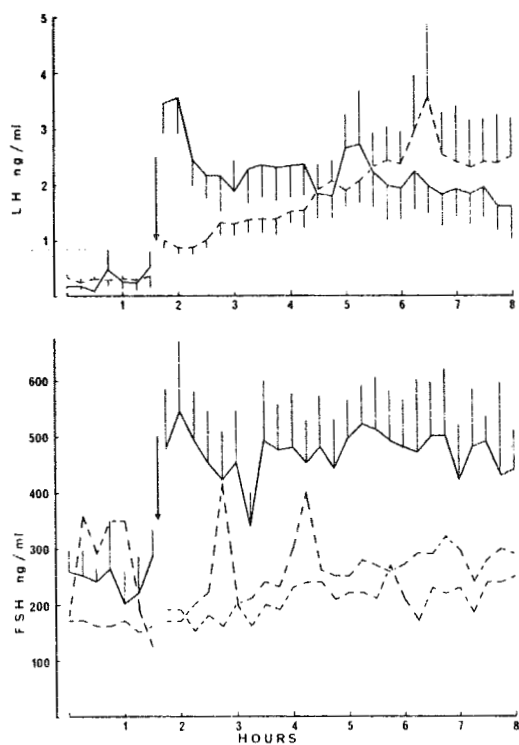


FIG. 1. Effect of i.v. injection of 5 mg copper acetate (arrow) at 95 min upon the plasma concentration of LH in five anestrous (—) and five estrous (---) anesthetized ferrets (upper panel) and upon the plasma concentration of FSH (lower panel) in five anestrous (—) and two estrous (---) anesthetized ferrets. Means \pm SEM are plotted except for the changes in plasma FSH concentrations in the two estrous ferrets, where the individual curves are presented.

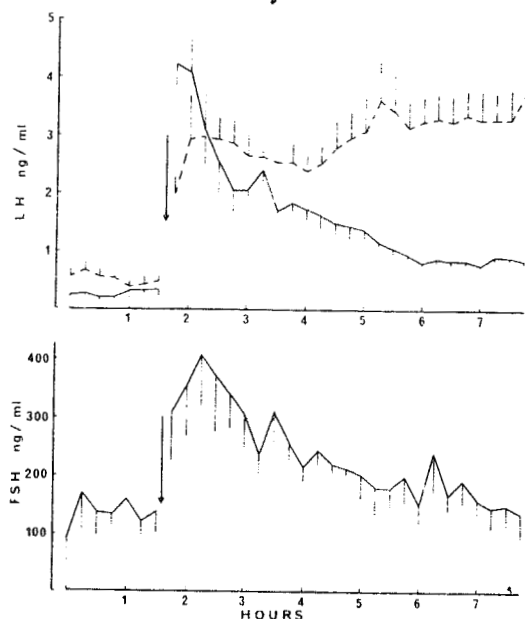


FIG. 2. Effect of i.v. injection of 5 mg copper acetate (arrow) at 95 min upon the plasma concentration of LH (upper panel) and FSH (lower panel) in four anestrous (—) and seven estrous (---) conscious ferrets. Means \pm SEM are plotted; one standard error among the control FSH values for the anestrous ferrets was too small for representation. The changes in plasma FSH concentration in estrous ferrets were not followed.

and much greater initial increase in plasma LH concentration, while in conscious anestrous ferrets the initial surge in plasma LH content was significantly greater than seen under anesthesia, but was followed by a steady decline toward control values. The changes in plasma FSH concentration produced by copper acetate were somewhat similar to those for LH, but were less pronounced.

SCIENTIFUR code: 3-5-0.

Biology of Reproduction, 25, 71-76, 1981.

2 figs., 17 references.

Authors' abstract.



RELATION BETWEEN MATING SYSTEM AND REPRODUCTION PERFORMANCE
OF FEMALE MINK.

G.B.C. Backus, Consulentenschap i.a.d. voor Pluimveehouderij (afd. Pelsdierenteelt), p/a Prinsenhof 20, 4041 BN Kesteren, Netherlands.

In 1981, the mating data of 541 first year dark females were registered. These females were housed on 3 farms. The animals belonged to a group of which results were collected for an experiment with pallet feeds. The females were classified according to the way they were mated. The following table shows the results.

mating	Farm 1 (N=178)			Farm 2 (N=192)			Farm 3 (N=171)		
	I	II	III	I	II	III	I	II	III
1-	3.26	35%	2.12	X	X	X	5.33	25%	4.00
1-1	4.00	29%	2.84	X	X	X	4.52	10%	4.07
1-7/10	3.31	32%	2.25	4.88	37%	3.07	-	-	-
1-7/10-1	4.59	16%	3.86	4.65	25%	3.49	5.31	20%	4.93
1-1-1	-	-	-	-	-	-	4.38	8%	3.50
1-1-7/10-1	-	-	-	-	-	-	5.11	-	4.70
1-13/16	3.86	29%	2.70	-	-	-	-	-	-
1-13/16-1	4.40	18%	3.61	-	-	-	-	-	-

I = average live litter size

II = females without live litter

III = kits per mated female

X = the results of these groups are not comparable, because the females of these groups hardly showed any decrease in body-weight during the period jan. - march.

de Pelsdierenfokker 1982 nr. 2 p. 46-48, in Dutch, 3 tables, 5 references

SCIENTIFUR code: 5-M.

Authors abstract.

RELATION BETWEEN CHANGE IN BODY WEIGHT AND REPRODUCTION
PERFORMANCE OF FEMALE MINK.

G.B.C. Backus, Consulentenschap i.a.d. voor Pluimveehouderij (afd. pelsdierenteelt), p/a Prinsenhof 20, 4041 BN Kesteren, Netherlands.

In 1981, 195 first year dark females were weighed on January the 16th and March the 5th. These animals formed part of a group of 600 first dark females (3 farms, on each farm 100 females on pallets and 100 females on kitchenfeed) of which results were collected for an experiment with pallet feeds.

The 195 females were housed on 2 farms and belonged to the control groups. According to their change in body-weight the females were classified into 4 groups as following; group I = 10% increase in body-weight to 8% decrease in body-weight, group II- 9% to 16% decrease in body-weight, group III + 17% to 24% decrease in body-weight, and group IV = more than 24% decrease in body-weight.

Group	Number of females	Change in body-weight	Females without live litter	Average live litter size	Kits per mated fem.
I	41	10%in.-8%de.	34%	4.2	2.8
II	83	9-16% decr.	29%	4.7	3.3
III	49	17-24% decr.	22%	4.4	3.4
IV	22	> 24% decr.	32%	4.3	2.9

After this classification the females were classified again, this time according to their body-weight on March the 5th.

Body-weight March 5th	Average live litter size	Females without live litter	Kits per mated fem.	Average decr. in body-weight
700 - 800 gr.	4.8	39%	2.9	20%
801 - 900 gr.	4.9	22%	3.8	15%
901 - 1000 gr.	4.6	31%	3.2	13%
1001 - 1100 gr.	4.4	35%	2.9	12%

de Pelsdierenfokker 1982, nr. 1 p.10-11, in Dutch, 1 table, 2 figs., 7 references.

Authors abstract.

SCIENTIFUR code: 5-M.

NUTRITION



Original report.

TOLERANCE LEVELS OF PCB IN MINK FEED.

A.A.M. Rietveld, General Manager, Northwood Fur Farms, Inc., Cary, Illinois, USA.

Since the summer of 1978 we have conducted a series of tests on our ranch to study the limits of alewife in our mink diets.

Alewife (*Pomolobus pseudoharengus*) is a Thiaminase fish which is very abundant in the Great Lakes. It has been used as mink feed in various forms, Dr. Schaible and Dr. Travis reported on it in the U.S. Fur Rancher of 1961. It is also used as a good portion of the protein by pet food producers.

The ever rising transportation costs, the abundance and the proximity of the source of supply spurred our interests.

Because of the industrial pollution of the Great Lakes over the last couple of decades and the fact that Coho Salmon waste from the Great Lakes has caused disastrous reproduction results for some American mink ranchers, we knew had to be cautious.

In the summer of 1978 we started our first feeding trials. We selected 24 females that has a proven reproduction and fed 10% of the dry matter in the form of alewife fishmeal. These mink were kept on the diet until the spring of 1979, until the kits were six weeks of age. As can be seen from the table there was no difference between the controls and the experimental diet.

In the fall of 1979 we finished part of the crop with alewife fishmeal so that the total in the feed never exceeded .5 ppm of PCB. Again, a group of mink was selected from the alewife fed production, this time also

including some young mink. Ten of the females were discontinued on the first of March and as can be seen from the table the results of these mink were very good; while the result of the mink fed alewife through reproduction and lactation was sub-optimum, as compared to the A² mink. In 1980 we decided to finish all our crop with 10% alewife fishmeal as taken from the feeds dry matter.

Reproduction results for the total farm were ...

1980	Ranch Average	10 Day's	5.25
1981			5.33
1982			5.1

These figures gave us more confidence in our practices. In 1981 we decided to study the effects on our mink if all the fishmeal was replaced by alewife fishmeal. A group of mink, including some old ones, was selected in July of 1981. They were graded and 17 females were kept as breeders and then discontinued the high alewife diet and fed the normal reproduction diet, which contains no alewife fishmeal. Of the pelted mink the subdermal fat was analyzed for PCB's. The reproduction result of these females in 1982 was sub-optimum for this group as compared to the controls.

We have concluded that on our ranch we can feed mink during the growing and furring period without any detrimental effect, up to .5 ppm of PCB in the feeds dry matter. As soon as the residual level of PCB in the mink body fat tissue rises above 5 ppm we experience poor results in the next reproduction cycle.

A positive development is that the level of PCB is on the decline in the Great Lakes area, in both game fish and the alewife. Sampling of this season indicated a decline of 50%, as compared to 1981. If this development is a trend we will see greater use of alewife, properly cooked to avoid Thiaminase, in the year's to come.

Year	P C B status in ppm (3)				Number of kits per female				Weight (grams)				
	Number of females		Feed growing	Feed repro-duction Residual	0	10	21	42	Three weeks		Six weeks		
	(1)	(2)		(4)					M	F	M	F	
1979	A	0 24	.3 - .5	.3 - .5	1 - 2			5.54	122	112	443	373	
	C	0 24						5.54	121	110	436	378	
1980	A	0 8	.3 - .5	.3 - .5	2 - 3	5.12	4.37	4.25	137	117	473	378	
	A	Y 6	.3 - .5	.3 - .5	2 - 3	6.00	3.83	3.50	106	95	391	330	
	A ²	0 10	.3 - .5		2 - 3	6.90	5.90	5.80	122	109	424	350	
1982	A	O Y 17	1.0-1.5		6.81	5.64	5.11	5.00	4.64	106	101	386	332
	C	O Y 20	.3 - .5		2.37	6.10	5.75	5.50	5.40	118	110	453	370

(1) A - Alewife

C - Control

A² - was discontinued March 1st, 1980. No PCB in feed during gestation and lactation.

(2) O - Old.

Y - Young

(3) PCB in ppm of dry matter. Based on analysis of the various batches.

(4) Residual is the amount of PCB in the sub-dermal mink body fat after prolonged feeding.

Typical analysis of Alewife fishmeal

PCB 2.8 - 5.1 ppm

Moisture 8% Fat 12%

Depending on batches.

Protein 65% Ash 14%.



References.

Biological Effects of PCBs and PBBs on Mink and Ferrets - A Review.

R.K. Ringer, R.J. Aulerich and M.R. Bleavins, Animal Science Department and Pesticide Research Center, Michigan State University, East Lansing University, MI 48824.

A Preliminary Study of the Fishmeal Industry. Feasibility of Expanding Fishmeal Production from Lake Michigan Alewives.

Max Kummerow, Richard Vilstrup, David Stuiber and Robert Lindsay, Department of Food Science and Meat and Animal Science, University of Wisconsin, 1977.

Fur Rancher - May 1978 and June 1978.

Midwest Sees Increased Fishmeal Production.

Alewife in Mink Diet. A Preliminary Report.

U.S. Fur Rancher - February - 1961.

Dr. P.J. Schaible and Dr. Hugh F. Travis, Michigan State University.

SCIENTIFUR code 8-5-M.

INVESTIGATION ON THE EXPERIMENTAL TECHNIQUE FOR DETERMINATION OF TRUE DIGESTIBILITY OF AMINO ACIDS IN FEEDSTUFFS FOR MINK.

Niels Glem-Hansen, Natl. Inst. of Animal Science, Fur Bearing Animals, Trollesminde, 48 H Roskildevej, DK 3400 Hilleroed, Denmark.

The amounts of metabolic faecal N and amino acids in mink were determined through linear regression analyses based on diets with different amounts of cod fillet as the sole source of protein. The values found in this investigation agree very well with corresponding values found by Skrede (1979a).

The accuracy of the true digestibility of amino acids was also investigated by means of regression techniques and using different levels of admixture of a given protein source.

In five diets, cod fillets were gradually replaced by cod offal. It can be concluded, that a reasonable accuracy can be obtained, if the admixture constitutes 50% of the total protein in the diet, but even at 25% admixture it was possible to obtain a rough estimate of the true digestibility of the amino acids.

SCIENTIFUR code: 3-6-M.

Acta Agric. Scand. 32, 1982, 161-165.

5 tables, 8 references.

Author's summary.

UTILIZATION OF L-CYSTINE AND L- AND D-METHIONINE BY MINK DURING THE PERIOD OF INTENSIVE HAIR GROWTH.

Niels Glem-Hansen, Natl. Inst. of Animal Science, Fur Bearing Animals, Trollesminde, 48 H Roskildevej, DK 3400 Hilleroed, Denmark.

The ability of mink to utilize sulphur containing amino acids (SAA) from natural ingredients, as L-methionine, D-methionine or L-cystine, was investigated.

Four groups of 10 pastel male kits each were fed diets containing equal

amounts of SAA originating entirely from natural ingredients and from natural ingredients supplemented with L-methionine, D-methionine and L-cystine, respectively.

The animals were fed the experimental diets for 3 weeks during the period of intensive hair growth.

It can be concluded that D-methionine was either not utilized, or utilized to only a minor extent by the mink, L-methionine and L-cystine were utilized slightly more effectively than was SAA from natural ingredients, but in most cases the differences were not statistically significant.

It can further be concluded that L-methionine was utilized just as effectively as a source of SAA for hair growth, as was L-cystine.

According to this study, optimum levels of SAA in mink feed, previously suggested by the author, should be reduced by about 25% if the SAA in the diets originates entirely from natural ingredients or from L-methionine or L-cystine.

SCIENTIFUR code:6-M.

Acta Agric. Scand., 32, 1982, 167-170.

3 tables, 15 references.

Author's summary.

PROTEIN AND ENERGY METABOLISM IN GROWING MINK (MUSTELA VISON).

A. Chwalibog, N. Glem-Hansen, Grete Thorbek, Natl. Inst. of Animal Science, 25 Rolighedsvej, DK 1958 Copenhagen V, Denmark.

Nitrogen and energy balances were measured individually in an experiment with 8 growing male mink (*Mustela vison*), with an initial live weight of 1000 g, fed two diets containing, respectively, 39.2 or 48.1% crude protein/kg DM and 22.4 or 21.1 MJ GE/kg DM. Indirect calorimetry with an open air circulation was applied.

The feed intake (ad lib.) increased from 210 to 350 g/d and in the period from 1000 to 1800 g LW the mean live weight gain was 12.5 g/d, with no significant difference between the diets.

The mean digestibility of nitrogen was $84.1 \pm 1.43\%$ and for energy the digestibility was $85.5 \pm 1.15\%$, with no significant differences between the diets.

The CO_2 production was $27.8 \text{ l/kg}^{0.75}$ and the O_2 consumption $34.4 \text{ l/kg}^{0.75}$ with CV-values about 9% indicating a high individual variation due to different activities of the animals. By including measurements of activity it should be possible to increase the accuracy in the determination of the gas exchange.

The mean nitrogen retention was about 1.0 g N/d for both diets, with great individual variations. In relation to a mean live weight gain of 12.5 g/d the values is too high, presumable caused by losses of ammonia from the daily collection of urine, the technique of which should be improved.

Energy retained was $29.8 \pm 7.10\%$ and $30.4 \pm 5.60\%$ of GE and the total energy loss in heat was $50.4 \pm 6.77\%$ and $47.6 \pm 6.03\%$ of GE. With the low accuracy obtained in the measurements no significant differences were found between the diets.

An attempt was made to estimate the energy requirement for maintenance (ME_m) and the energetic efficiency by growth (k_g). Unacceptable values were obtained, indicating that more experiments with mink should be carried out in order to establish valid figures for ME_m and energy requirement for activity (ME_a).

SCIENTIFUR code: 6-M.

Arch. Tierernähr., 32, 1982, H. 7/8, 551-562.

6 tables, 19 references.

In English with summaries in German and Russian.

Authors' summary.

THE INFLUENCE OF THE PROTEINS AND OLIGOELEMENTS QUALITY
ON THE REPRODUCTIVE PERFORMANCES OF MINKS.

Dr. N. Pastîrnac, Ing. R. Gruia, Depart. Agric. de Stat, I.A.S. Prejmer,
jud. Brasov, R.S. România.

It was studied the fodder administrated during the pregnancy, whelping and lactation period at mink between the years 1980-1981, upon two lots of 7000 females and respectively 6992 females. Observations had been made concerning the chemical structer of the foddors as well as the level they may influence the reproductive capacity of minks.

The main conclusions that may be drawn are linked to the cumulated growth of raw proteins and carbon hydrates with 2.08%, in the dry substance of the rations which influence positively the reproductive activity of mink, especially the lactation.

The improvement of the protein quality, by the growth of the quantity of the essential amino acids with 1.07%, from which arginine with 1.17%, together with the improvement of the oligoelement quality through the intensive utilization of the premix for mink, had a stimulative effect upon mink reproduction. Thus, the number of mated females grew with 2.4% in the year 1981, and the viability of kits during the lactation period grew considerably, with 4.75%, fact that led to the accomplishing of a grown economical prolificity, with 0.28 weaned kits per whelped female. This ment a growth of the mink fur production with 5.6% in the year 1981, in comparison with the year 1980.

SCIENTIFUR code: 6-5-M.

Instit. Agron. Timisoara, Scientific symposium, dec. 1981.

2 tables, 4 figs., 8 references.

In Romanish with abstracts in English and French.

Authors' summary.



Try to improve the
oligoelement quality!

FODDER YEASTS AS A PROTEIN SUBSTITUTE.

Кормовые дрожжи — заменитель белка

N. Sh. Perel'dik, P.T. Kletskin, E.M. Glazov, USSR.

After mating, foxes were fed on a diet of fish meal, barley and mixed fat and with fodder yeast at 2.0, 4.0 or 7.4 g/100 kcal. Percentage of pelts without any defect was 42.9, 37.3 and 27.9, respectively, for females and 28.0, 34.7 and 20.0 for males. Body weight at the end of the feeding period was 6.0, 5.9 and 6.2 kg for females, and 6.1, 6.4 and 6.0 kg for males.

SCIENTIFUR code: 7-F.

Krolikovodstvo i Zverovodstvo, No.3, 14, 1981.

4 tables.

In Russian.

CAB-abstract.

ORIGANOCHLORINES IN WILD MINK (MUSTELA VISON) FROM NORWAY.

J.U. Skaare, A. Polder, E.M. Brevik, N.J. Kveseth, Vet. College of Norway, Dept. of Pharmacology and Toxicology, P.O. Box 8746, Oslo, Dep. 1, Norway.

Levels of PCBs, DDE and HCB have been determined in abdominal adipose tissue from wild mink caught in the Norwegian counties of Sogn and Fjordane, Rogaland and Hedmark. The average organochlorine levels based on fat weight, was about 1 ppm DDE, 0.1 ppm HCB and 1 to 15 ppm PCBs (Tables I and II). No significant differences ($P \leq 0.05$) were found in organochlorine levels in wild mink from these counties.

A comparison of the levels (fat weight basis) of organochlorines in mink and cod from relative uncontaminated waters along the Norwegian coastline and Lagesild (*Coregonus albula*) from Lake Mjøsa located in the eastern

region of Norway was done (Brevik et al. 1978, Brevik 1981). It was concluded that the present study revealed no dramatic differences in organochlorine levels in mink and fish.

In mink DDT was detected in only 2 samples, while in cod from Norwegian fjords DDT accounted for 24 to 65 percent of sum-DDT (Kveseth & Bjerk 1976). Thus, metabolism of DDT in the food chain may be of importance for the accumulation of DDE in mink. Furthermore, the distribution pattern of the PCBs in mink differed from that observed in fish. In mink, as in arctic fox (Norheim 1978), a greater portion of PCBs are present as the more highly chlorinated PCB isomers. This indicates that the metabolism of the PCBs throughout the natural food chain results in accumulation of higher chlorinated, more persistent and less biodegradable PCB isomers in both mink and arctic fox. The results are listed in table II and the indicated geographical differences in levels of the individual PCB compounds containing 7 chlorine atoms, seem to follow the same trend as the corresponding levels of PCBs.

SCIENTIFUR code: 8-M.

Nord. Vet.-Med. 33, 366-370, 1981.

2 tables, 15 references.

Authors' summary.

A PROTEIN MEAL FROM FLY LARVAE IN DIETS FOR MINK.

ИСПОЛЬЗОВАНИЕ БЕЛКОВОЙ МУКИ ИЗ ЛИЧИНОК МУХ В РАЦИОНАХ ПОРОК

Yu. A. Koltypin, F.I. Zlochevskii, K.G. Vorob'ev, M.N. Sukhova,
T.M. Karavaeva, T.V. Erofeeva, USSR.

Continuous feeding of female mink for more than 100 days on a diet containing ground house-fly larvae to provide up to 30 percent of total dietary protein had no adverse effect on health, conception rate, pregnancy or lactation, or on the growth and development of their offspring.

SCIENTIFUR code: 7-M.

Nauchnye Trudy Novosibirskogo Selskokhozyaistvennogo Instituta, 128, 30-33, 1980. - Referativnyi Zhurnal, 58, 1981, 2.58.693.

3 tables.

CAB-abstract.

In Russian.

SLAUGHTER VALUE OF NUTRIA BROILERS AT INDUSTRIAL FEEDING.

(Wartość rzeźna brojlerów nutrii przy żywieniu przemysłowym).

Janusz Kuźniewicz, Anna Kuźniewicz, Grzegorz Kowalczyk, Maria Miniewska,
Institute of Breeding and Technology of Animal Production, Poland.

The authors conducted the experiment in 2 repetitions in 1974 and 1975 in order to determine the influence of industrial feeding with granulate 159 on nutria meat characteristics, at the age of 6 months. Each year the population included 40 individuals of Greenlandic sapphire variety. The sex relation was 1:1. The experiments were made each year in a 2-group arrangement/group I was fed traditionally, group II was fed as mentioned above/. Both groups of stock were kept in the pens.

The results are as follows:

- the slaughter value of nutria broilers was lower as compared with older nutria/heavier nutria/.
- broilers fed only with granulate 159 had better slaughter value, and the edible by-products as well as the skin were heavier than those of the broilers fed traditionally the skin of the broilers of Greenlandic sapphire variety was three times as heavy as the skin of heavier nutria/older/ of standard type.
- slaughter wastes were larger with nutria broilers fed traditionally.
- the relation of meat to bones was less favourable with nutria broilers than with older nutria/heavier/. Feeding with the granulate 159 caused also heavier overfattening of the carcasses as compared with the stock fed traditionally.
- the meat of nutria broilers contained more water and protein but less fat, which meant better slaughter value.

SCIENTIFUR code: 6-0.

Zeszyty Naukowe Akademii Rolniczej We Wrocławiu. Zootechnika (Poland)
(no. 125), p. 209-214, 1980.

3 table, 9 references.

Authors' summary.

In Polish with summaries in English and Russian.

FERROANEMIN - PRETENTING COTTON FUR.

**Ферроанемин
против белопухости**

N.S. Pierieldik, D.N. Pierieldik, V.S.Snytko, USSR.

By adding 20 mg Fe as Ferroanemin to the mink feed, cotton fur was pretented. It is argued that, Ferroanemin (Fe-diethylene aminopentaacetic acid) which as a complex compound is inert to trimethylamineoxide.

SCIENTIFUR code: 6-3-M.

Krolikovodstvo i zverodstvo, Moskva, 1980, Part 33, page 33.

In Russian.

Translated by E. Jørgensen

Abstracted by Asbjørn Brandt.

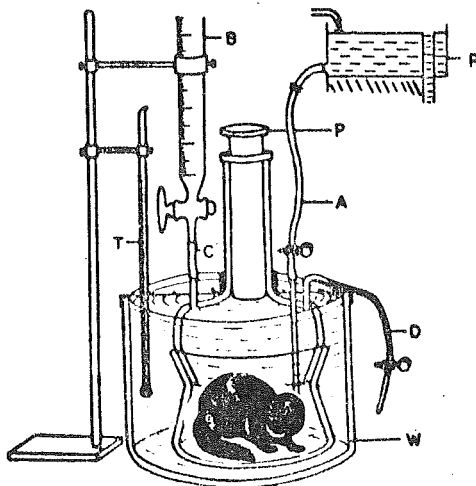
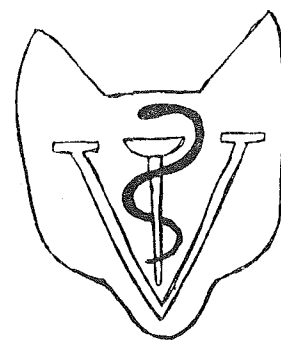


Fig. 1—Apparatus used for experiments on oxygen consumption



VETERINARY

Original report.

**BIOCHEMICAL CRITERIA FOR ASSESSING THE STATE OF HEALTH OF
FARM-BRED FUR-BEARING ANIMALS. COMMUNICATION I.
BIOCHEMICAL STATUS OF BLOOD IN A HEALTHY ORGANISM.**

V.A. Berestov, L.K. Kozhevnikova, Institute of Biology, Karelian Branch of the USSR Academy of Sciences, Pushkinskaya, 11, 185610, Petrozavodsk, USSR.

Modern biochemical tests are employed to assess the state of health of farm-bred fur-bearing animals. To develop these tests, morphological (erythrocyte and leucocyte content, leucocyte formula) and biochemical blood parameters have been studied in females and males of 10-day- to 6-month old minks and polar foxes of different colours in different seasons. In blood serum we determine the concentration of metabolites – total protein and its fraction ratio, glucose, glycoproteins, total lipids, cholesterol, lipoproteins; the activity of enzymes such as lactic dehydrogenase (LDH; EC 1.1.1.27), amylase (EC 3.2.1.1), aspartate-aminotransferase (GOT; EC 2.6.1.1.), alanine-aminotransferase (GPT; EC 2.6.1.2.), alkaline phosphatase (AP; EC 3.1.3.1.), pseudocholinesterase (ChE; EC 3.1.1.8.), the level of nonspecific immunity factors: viz., lysozyme, β -lysine and the complement. The phagocytic function of leucocytes has been studied.

The biochemical parameters of blood studied were unlike in different age periods and seasons and were dependent on the sex and species of fur-bearing animals. The amount of erythrocytes and the concentration of hemoglobin increased with the age of the animals to become higher in minks than in polar foxes. The level of glucose in blood serum rose and that of total lipids dropped. The level of cholesterol did not change with the growth of animals. The concentration of these metabolites in adult minks and polar foxes was higher in winter than in summer.

Serum enzyme activity also suffered age rearrangements. A rise in total LDH activity was recorded in 10, 30 and 150-day-old minks and in 10, 60 and 150-day-old polar foxes. In early ontogenesis LDH-5 prevailed in both families. A transition to increase anodic isoenzyme was observed as the animals grew. However, the relative content of LDH-5 in minks was always higher and the content of LDH-1 was lower than those in polar foxes.

Low GPT activity was revealed in the blood serum of 10-day-old minks. In polar foxes it was 10-times greater and exceeded the level observed in adults. GPT activity approached the adult level only in 2-month-old minks. The next rise in the activity of both transaminases was seen in 6-month-old animals. In all the periods GOT activity was higher than GPT activity.

A high level of ChE in one-month-old minks and polar foxes and that of AP in two-month-old animals was a common feature. ChE activity of 60-day-old animals corresponded to that of adults. AP was stabilized at this level in 5-6 month-old individuals.

In adult minks and polar foxes, enzymes of carbohydrate metabolism increased in winter and those of protein metabolism and AP - in summer. In polar foxes, ChE activity augmented in winter and in minks it declined.

The pronounced phagocytic activity of leukocytes was common for minks and polar foxes at the first stage of postembryogenesis. It increased as the cubs grew but it decreased by the period of animal sexual maturity. Characteristic of polar fox phagocytosis, in contrast to mink phagocytosis, was a longer phase of the increased activity of leukocyte phagocytosis. In adult minks, phagocytic activity rose in spring, whereas in polar foxes, seasonal variations in phagocytic activity were small as compared to minks.

Mink were characterized by the early formation of a nonspecific immunity system: in early postembryogenesis lysozyme activity was at the level observed for adult animals and the level of the complement and β -lysines was even higher. Complement activity declined with age; lysozyme bactericidity approaches the maximum values in 4-month-old cubs and lysine properties of β -lysines were at the lowest level during that period. As

minks grew their non-specific immunity values were observed to rise reaching a maximum in 4-month-old animals.

The seasonal dynamics of nonspecific immunity indices in minks was characterized by increased complement activity in summer, enhanced activity of β -lysines in spring and a gradual drop in lysozyme activity by autumn. In polar foxes, these variations were expressed by a rise in β -lysines and decreased activity of the complement in spring as compared to the stable background of lysozyme through the year.

In farm-bred minks and polar foxes under the same climatic-geographic conditions some differences were observed at various functional systems: phagocytosis in polar foxes was characterized by significant microbial capacity of leukocytes. In minks, the level of humoral factors of nonspecific immunity: viz., lysozyme, β -lysines, complement, serum transaminase and LDH activity was higher than that in polar foxes, while amilase, Ap and ChE activity was lower. These differences are due to the fact that the animals belong to different families and that they had a specific ecological specialization in the past.

The results of the studies on the biochemistry of fur-bearing animal blood were statistically analysed. As a result, we have an idea of "normal health" and the confidence interval ($M \pm$) of biochemical blood parameters.

The level of biochemical blood parameters was shown to reflect both the common metabolic state and the health of animals as a whole. One may assess the state of protein metabolism by the concentration of total protein, the quantitative ratio of its fractions, the activity of the key enzymes of amino acid oxidizing catabolism - GOT and GPT. The intensity of carbohydrate metabolism is indicated by the level of endogenous glucose pool, glycoprotein concentration, the activity of LDH, one of the key enzymes of the glycolysis, and the activity of amylase, a hydrolytic enzyme.

The magnitude and directivity of fatty metabolism are well characterized by the total blood-serum, lipid level, cholesterol concentration, the ratio of lipoprotein fractions and the activity of ChE which is to be found in the chain of B-lipoprotein formation from their precursor.

The level of humoral factors of nonspecific immunity (lysozyme, β -lysines, complement) and the degree of the phagocytic function of leukocytes are the informative indices of the resistance of an organism to unfavorable factors.

A healthy organism of fur-bearing animals is characterized by the conservation of enlisted biochemical blood parameters within the confidence interval. Pathologies of any genesis or unfavorable environmental factors are accompanied by a departure of these values which is a specific "alarm signal" warning of the change in the state of animal health.

Original works were published in the USSR: in Russian: V.A. Berestov "Laboratory methods for assessing the state of fur-bearing animal health", Petrozavodsk, "Karelia", 1981, 152 p.; V.A. Berestov, L.K. Kozhevnikova "Blood enzymes of fur-bearing animals", Leningrad, "Nauka", 1981, 186 p.; Collected articles (edited by V.A. Berestov): "Physiological fundamentals of fur-bearing animal resistance", Petrozavodsk, Karelian Branch of the USSR Academy of Sciences, 1976; "New data on physiology and biochemistry of fur-bearing animals", Petrozavodsk, 1977; "New data on physiology and pathology of fur-bearing animals", Petrozavodsk, 1978; "Clinical-biochemical aspects of the norm and pathology of fur-bearing animals", Petrozavodsk, 1979; "Adaptive reactions of fur-bearing animals", Petrozavodsk, 1980.

В.А. Берестов "Лабораторные методы оценки состояния пушных зверей", Петрозаводск, "Карелия", 1981, 156 с., В.А. Берестов, Л.К. Кожевникова "Ферменты крови пушных зверей", Ленинград, "Наука", 1981, 186 с. Сборники (под ред. В.А. Берестова): "Физиологические основы резистентности пушных зверей"; Петрозаводск, Карельский филиал АН СССР, 1976 г.; "Новое в физиологии и биохимии пушных зверей", Петрозаводск, 1977.; "Новое в физиологии и патологии пушных зверей", Петрозаводск, 1978 г.; "Клинико-биохимические аспекты нормы и патологии пушных зверей", Петрозаводск, 1979 г.; "Адаптационные реакции пушных зверей", Петрозаводск, 1980.

В.А. Берестов
Карелия

Original report.

BIOCHEMICAL CRITERIA FOR ASSESSING THE STATE OF HEALTH OF
FARM-BRED FUR-BEARING ANIMALS. COMMUNICATION II.
VARIATIONS IN THE BIOCHEMICAL STATUS OF BLOOD CAUSED BY
SOME DISEASES.

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In a previous communication biochemical blood parameters of a healthy organism have been presented which serve as a basis for developing standard values for the laboratory diagnosis of blood serum in minks and polar foxes.

Of quite a number of the parameters enumerated serum enzymes and non-specific immunity factors are especially sensitive to pathological effects. In many cases they are the first to indicate disturbed homeostasis. We have studied non-contagious (anaemia, lactational cachexia, fatty hepatitis), contagious (Aleutian disease, pseudomonosis, pasteurellosis) and infectious (diphyllobothriasis, toxascaridosis) diseases of fur-bearing animals.

Lactational cachexia caused a drop in total protein concentration by 15-20%, concomitant with a substantial decrease in albumin fraction. A change in GPT activity indicates disturbed protein metabolism. The level of GPT activity in all cases exceeded the upper limits of the confidence interval. LDH activity also rose. The level of complement and that of lysozyme increased by 120 and 70%, respectively, whereas β -lysozyme activity declined by 40%.

In minks, the glycogen- and protein-synthesizing function of the liver was markedly disturbed as a result of fatty hepatitis. Sharp blood serum hypoglycemia was accompanied by the inhibition of LDH and amylase activity, which in most cases was beyond the lower limit of the confidence interval. The permeability of hepatocyte increased to result in the enhanced activity of cytosolic (GPT) and mitochondrial (GOT) enzymes in blood.

The GOT:GPT ratio decreased.

Aleutian disease in minks was characterized by dis- and paraproteinemia. In most cases the cholesterol content of blood serum exceeded the confidence limits of the norm. Hypoglycemia was accompanied by decreased total LDH and amylase activity in blood serum, while GPT activity rose by 24%.

The antigenic irritation of the reticular-endothelial system and disturbed metabolism resulted in the altered humoral factor level of immunological resistance. The γ -globulin fraction increased in blood serum together with lysozyme and complement activity, β -lysines persisted within the normal confidence limits.

Being regular for many virous and bacterial infections such changes indicate the stressed state of an organism. Thus, in minks, pseudomonosis resulted in sharp disturbance of metabolism and liver functions. It is shown by the increased activity of serum transaminases - GOT by 85%, GPT - by 23% and alkaline phosphatase - by 133% as compared to the norm. The activity of carbohydrate metabolism enzymes was usually inhibited. The level of humoral factors of natural resistance in infected animals usually exceeded the upper limits of the norm.

Cesta invasion into polar foxes led to the development of anaemia leucocytosis, eosinophilia, dysproteinemia in the animals. It usually resulted in increased α -globulin and decreased γ -globulin fractions. Two months after parasite invasion, during the phase of its intensive growth and high productivity, LDH activity in blood serum increased by 127% in infected polar foxes. An increase in LDH activity was due to activated glycolysis, because as the parasite developed, the redox processes in the host organism were suppressed. It was indirectly shown by developed erythropenia and hemoglobinopenia.

Diphyllobothriasis resulted in hypoamilasemia: enzyme activity was twice as low, which maybe caused by the inhibition of its synthesis associated with some characteristics of glycogene transformation at helminthoses. The activity of transaminases was disturbed to a lesser extent than that

of enzymes of carbohydrate metabolism. GOT activity was somewhat higher (by 10%).

Changes in the humoral factors of natural resistance were represented by increased complementary activity and decreased lysozyme and β -lytic activity. At the initial stage of the disease these shifts were poorly expressed, but as the parasite grew they intensified.

Toxascaridosis in polar foxes caused by parasiting T. leonina resulted in functional reconstruction in hematogenetic organs, which led to the development of anaemia and to the inhibition of the key metabolic reactions. At low doses of infection during the first fourteen days complement activity rose significantly and that of β -lysines increased to a lesser degree, which showed the active resistance of the organism to invasion. Intensive infection resulted in decreased β -lysine activity. It was an unfavorable symptom, the more so, the activity of LDH, GOT, GPT, AP and ChE dropped simultaneously. The largest departure in enzyme-immunological values were observed on the seventh day after the invasion, which coincided with larval migration into the slime layer of the host intestine. The second stage of homeostasis disturbance (on the 14-30 day after the invasion) was characterized by increased ChE activity and by a further decrease in LDH, GOT and AP activity.

The above examples convincingly show the presence of significant disturbances in homeostasis in minks at the pathologies of different geneses. This caused the biochemical parameters of blood to exceed the confidence limits. It should be noted that the absence of strict specificity in the response of enzyme-immunological systems to one or another irritant is not an obstacle, because in the long run it reflects the unfavorable state of animal health.

The analysis of the general picture of changes in the enzymatic activity of blood serum induced pathologies of different genesis shows a number of regularities caused by the stereotype disturbance of metabolism. As a rule, all the fur-bearing animal diseases studied result in increased serum transaminase and alkaline phosphatase activity. There may be several reasons for serum hyperfermentemia, but the final effect is associated with the disturbance of cellular membrane permeability and, hence, with subsequent mass transition of enzyme into blood.

Pathologies usually cause a drop in false cholinesterase activity. This signals of the reduced protein-synthesizing function of the liver, which is closely associated with this enzyme. Departures in carbohydrate metabolism enzyme activity are not always synchronous, and they are more specific to one or another disease. In the cases when the organism energetic is tensed (dystrophic states of lactational cachexia type, anaemia, the initial stages of invasion) LDH activity is enhanced to compensate energy production through the glycolitic pathway. Acute infections (pseudomonosis) or obvious hepatocyte destruction (their fatty infiltration) result in reduced enzyme activity at the expense of its inhibited synthesis.

Similar regularities may be noted in the general picture of changes in the humoral factor of natural resistance. The disturbance of energetics (lactational cachexia, diphyllbothriasis and toxascaridosis invasion) results in the lowered level of serum β -lysines whose involvement in energy exchange is well known. Acute infectious diseases lead to a rise in this index. A low background of β -lysines is compensated by an increase in complement, another factor of natural immunological resistance. There was no regularity in lysozyme changes.

In performing a complex enzymatic-immunological diagnosis of the state of fur-bearing animal health one should observe the duration of maintenance of high or low activity background for the values to be determined. This is specific for different forms of pathology. This enables us to control the efficiency of one or another positive effect.

Enzymatic-immunological indices may be employed not only for assessing the state of health of animal stock on the whole. They also reflect individual characteristics of an animal, because under unfavorable conditions they exceed the normal confidence limits not in all the animals. Further selection of animals with respect to resistance characteristics will help to develop high-productive stock on farms.

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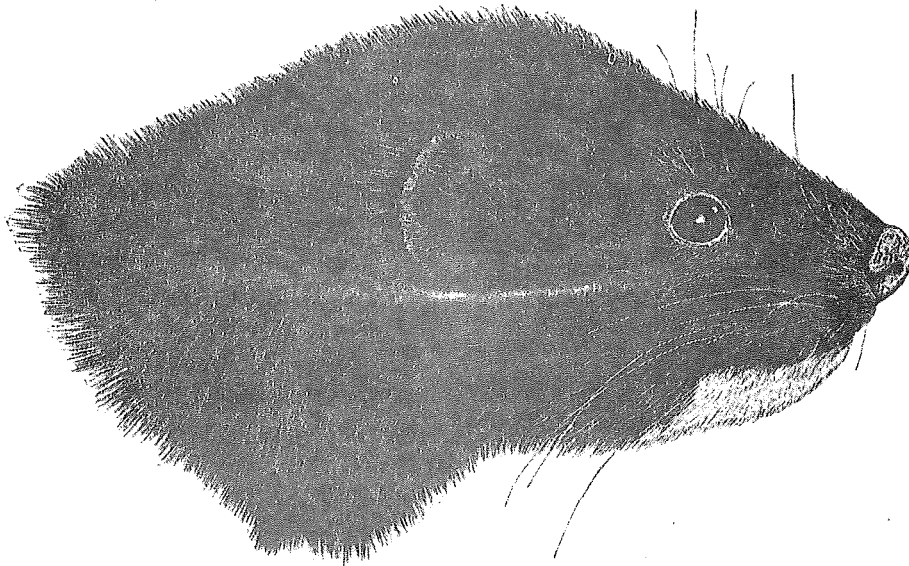
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SCIENTIFUR code: 3-9-M-F.



Original paper.

INTERNATIONAL ALEUTIAN DISEASE AND MINK VIRUS ENTERITIS
CONFERENCE HELD IN WISCONSIN.

Herbert Kammer, Ph.D., Invenex Veterinary Laboratories, P.O. Box 37, Middleton, Wisconsin 53562.

Thirty persons from eight nations attended a recent three-day conference, October 13 through 15, 1981 in Madison and Middleton, Wis., to share their knowledge concerning Aleutian Disease (plasmacytosis, A.D.) and Mink Virus Enteritis (MVE) two of the most serious diseases in mink. The first two days were devoted to a counterimmunoelectrophoresis (CEP) workshop, where participants had a chance to discuss AD testing methods as well as to observe or practice these techniques in the laboratory. On the third day, the key topic was mink virus enteritis.

The agenda for the CEP portion included an exchange of ideas on topics such as supplies, methods of testing, interpretation, and standardization, as well as communication with the farmer. The goal was to upgrade testing methods so as to achieve the highest accuracy possible at a cost the farmer can afford. This portion of the conference was conducted at the Wisconsin State Animal Health Laboratory and at Invenex Veterinary Laboratories (United). The participants included technicians and supervisors from private and state laboratories from the U.S., and seven other nations.

The conference was chaired by Dr. Herbert Kammer of United. Registrants included Carlos and Laura Garcia-Mata, Argentina; Gordon Finley and Douglas Shano, Canada; Bent Aasted, Denmark; Jouni Kangas, Finland; B. A. Bokhout, Holland; Bubrand Loftsgaard, Norway; Torbjorn Meherland, Sweden; and U.S. registrants Hans Haugen, Jose Novac, and William Rietveld, Illinois; Leo Weisdorfer, Oregon; Janice Egbert, Jill Hobbs, and Susan Ingram, Utah; David Shen, Washington; and Marcia Hyde, Pamela Kourtidas, Lynell Neefe, Tim Rauls, Sue Samuelson, and Art Schneider of Wisconsin.

The program included two guest speakers, Dr. G. R. Hartsough, EMBA-GLMA Ranch Service, and Dr. Don Bosman, Staff Veterinarian, Wisconsin Department of Agricultural. A summary of their presentations follows:

Aleutian Disease and the significance of the CEP test in its eradication -

Dr. Hartsough.

Aleutian Disease first was recognized as a specific disease entity in the early 1950's. Drs. Hartsough and Gorham reported this in 1956 and indicated that it was not necessarily confined to mink homozygous for the Aleutian color phase gene.

Clinical evidence indicated the disease was transmissible. In the early 1960's the causative agent was identified as a slow virus. Further research characterized the virus, the pathogenesis, and the epidemiology. The adverse economic impact of AD has been difficult to measure; however, we can conclude that it has been extremely severe.

Soon the iodine agglutination test (IAT) was introduced as a means of detecting and eliminating progressively infected animals. The IAT served the industry well in that it was effective in controlling the disease at a level that allowed farms to operate at an economically viable level. They were unable to do this prior to the IAT. This was especially true on those farms where a large percentage of the herd was homozygous for the Aleutian gene and farmers were experiencing severe losses.

While the IAT was a tremendous aid in eliminating active Aleutian Disease, it did not detect those animals that were infected but not showing signs of illness; however, this group served as a reservoir of the virus on the farm.

With the advent of the CEP test, it was possible to select and eliminate all mink carrying Aleutian Disease antibodies. The number of animals revealing antibodies at the time of the test but which do not actually harbor the AD Virus is probably

insignificant. The CEP test has accomplished complete eradication of the disease on a number of U.S. farms. In many other instances, the infection has been reduced to a low level. On these, final eradication should not be difficult. While there has been some concern regarding consistency and repeatability of the CEP test, the margin of error is probably no greater than with most diagnostic tests. The techniques are being improved. I am sure standardization of the technology involved in the tests will be helpful.

The structure of a successful Aleutian Disease eradication program - Dr. Bosman.

There are three terms that need to be understood in considering this topic. The words "eradication," "certification," and "control" often are confused or misused as synonyms, which they are not. Eradication is the total removal of a disease from a specific geographic area, such as a farm, state, region, or country. Certification is a written statement issued by a regulatory body verifying eradication or disease-free status. Control is the restraint of a disease to an acceptable level.

Essential to all of these concepts is the correct diagnosis of the disease in question. In the case of Aleutian Disease, this best can be done by counter-electrophoresis of mink blood serum in the laboratory. The mink rancher must have faith in the accuracy of the laboratory procedure in order to use it as the basis for his management decisions.

There are approximately 325 mink farms in Wisconsin, of which 105 have submitted 388,570 sera for testing at Wisconsin's Central Animal Health Laboratory since December, 1976. Most of these farms have tested for a number of years. Eighty percent of the samples were submitted in four months of each year (November through February), which causes scheduling problems for the laboratory. Of these herds, 25 or 30 appear nearly eligible to be certified as Aleutian Disease-free farms in Wisconsin. Two others have been certified in the past, but chose to discontinue the program.

If all the diseased mink are not removed, they will continue to transmit the disease to others. Eradication requires diligent testing and removal of all positives to achieve a negative herd status. The herd then can be tested for recertification with fewer animals being sampled. Without this long-term commitment eradication becomes control. A control program necessitates testing more animals for a greater period of time than would be required to gain and maintain a certified disease-free herd.

It appears that many Wisconsin farmers have elected the short-term benefits of control rather than the long-term benefits of eradication of Aleutian Disease from their herds.

Summary of the Mink Virus Enteritis Conference

Mink Virus Enteritis is a problem which seems to be increasing in several mink raising countries. Problems with this disease are sometimes associated with one or more of the following:

1. A high incidence of Aleutian Disease
2. Recent purchase of mink which may be shedding mink enteritis virus.
3. Vaccination of kits too early in instances where dams have higher than normal antibody levels.
4. Use of the three-way (distemper-MEV-botulism) vaccine.

Participants especially invited to this session included Dr. A. Krohn, Diagnostician at the Wisconsin Animal Health Laboratory; Dr. Shen, Washington State University, doing the research with Dr. Gorham on behalf of the Mink Farmer's Research Foundation; Dr. Richard March, University of Wisconsin Veterinary Science Department; Dr. E. W. Marty, American Scientific Laboratories; and Anthony Rietveld, Northwood Fur Farm.

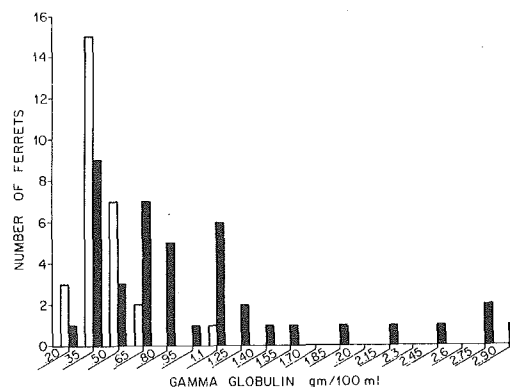
Fur Rancher, February 1982, page 12.

ALEUTIAN DISEASE IN FERRETS.

Helen G. Porter, David D. Porter, Austin E. Larsen, Dept. of Pathology,
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90024, USA.

When 32 antibody-free ferrets were inoculated with the highly mink-virulent Utah-1 strain of Aleutian disease virus (ADV), most developed ADV antibody starting 15 days after infection, but the antibody titers were much lower than those seen in mink. Relatively small amounts of ADV were demonstrated in CRFK cell culture, using ferret spleen and lymph node homogenates only 4 to 10 days after experimental infection, but low-level viral persistence for 180 days was shown by mink inoculation. In ferrets inoculated with the Utah-1 strain of ADV did not develop elevated gamma globulin levels, but did have mild tissue lesions. Forty-two percent of a group of 214, approximately 1-year-old, recently pregnant, female ferrets were found to have antibody to ADV. An analysis of the serum proteins of the ferrets with ADV antibody showed that they had a significant, but mild, elevation of their serum gamma globulin. Serial ferret-to-ferret transmission of a ferret strain of ADV by inoculation of spleen homogenates was demonstrated, and some of these ferrets developed liver lesions. Mink inoculated with ferret ADV made antibody, but did not develop hypergamma-globulinemia or tissue lesions. Although both ferret and mink strains of ADV replicate and persist in the ferret, they fail to cause severe disease of the type usually seen in the closely related mink. Mink and ferret ADV strains appear to be biologically distinct.

FIG. 1. The distribution of serum gamma globulin in normal ferrets (open bars) and those naturally infected with ADV (solid bars). The infected ferrets have a significantly greater ($P < 0.0005$) serum gamma globulin than the normal ferrets do.



SCIENTIFUR code: 9-0.

Infection and Immunity, Apr. 1982, 379-386. Vol. 36, no.1.

3 tables, 4 figs., 22 references,

Authors' abstract.

**BLASTOGENESIS OF LYMPHOCYTES FROM MINK INFECTED WITH
ALEUTIAN DISEASE VIRUS (ADV).**

R.E. Race, J.E. Coe, M.E. Bloom, NIH, NIAID, Rocky Mountain Laboratories ,
Jamilton, MT 59840. USA.

A lymphocyte proliferation assay has been utilized to examine responsiveness of lymphocytes from ADV infected or normal mink. When tested with ADV-associated antigens, all 22 lymph nodes excised from 14 mink with advanced aleutian disease responded better to ADV than to a normal antigen preparation identical to the ADV antigen but lacking viral components. ADV responsiveness was detectable within 2 weeks of ADV infection, subsequently increased in magnitude and was maintained throughout the disease course. Mink sensitized to keyhole limpet hemocyanin (KLH) or human gamma globulin (HGG) failed to respond to the ADV antigen but did respond to the respective sensitizing antigen. A good blastogenic response to KLH and HGG also was detected in specifically sensitized mink even though they were affected with advanced aleutian disease. Blastogenesis was most easily detected in nylon wool passaged cells; adherent cells often obscured responsiveness by nonspecifically increasing background incorporation of tritiated thymidine. If cells were incubated in the presence of terminal autologous serum, a depressed antigen response was observed. Results of this study indicate T cell responsiveness to ADV antigens and nonviral antigens is preserved throughout the course of aleutian disease. This assay may be useful in defining the role of T cells in this unusual lymphoproliferative disorder.

SCIENTIFUR code: 9-M.

Fed. Proc. 39 (3, Part 1) 356 1980.

Meeting abstract.

**ALEUTIAN DISEASE OF MINK.
DESCRIPTION, DIAGNOSIS, PREVALENCE IN FRANCE, AND METHODS
OF ERADICATION.**

(La maladie aleoutienne du vison. Description, diagnostic, incidences
en France et possibilites d'eradication).

Chr. Richard, Dr. vet., 5, avenue d'Aligre, 78400 Chatou, France.

The techniques and relative merits of the iodine, counterelectrophoresis

(CEP), immunofluorescence and ELISA tests for AD are discussed. The CEP test, with an efficacy of more than 90 percent, was used for a large survey of mink ranches in France, in 1979/1980. A mean of 62 percent of positive reactors was found, with a range from complete absence of infection to a ranch with 96 percent of infected mink. The relative merits of the Danish and U.S. types of eradication programme are discussed. In the Danish system, ranches are classified from A (no reactors) to H (more than 40 percent of reactors, isolated from non-reactors). Under the American system, tests are made twice yearly for two years, with destruction or segregation of positive breeding females.

SCIENTIFUR code: 9-M.

Bull. Soc. Vet. Prat. de France, Nov. 1980, 64, 9, 773-790.

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CAB-abstract.

In French.

**MITOGEN- AND VIRAL ANTIGEN-INDUCED TRANSFORMATION OF
LYMPHOCYTES FROM NORMAL MINK AND FROM MINK WITH
PROGRESSIVE OR NONPROGRESSIVE ALEUTIAN DISEASE.**

Soo Hwan An, Bruce N. Wilkie, Dept. of Vet. Microbiology and Immunology,
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N1G 2W1, Canada.

Peripheral blood lymphocytes (PBL) from mink with progressive Aleutian disease (AD) were shown to be significantly less responsive to phytohemagglutinin, concanavalin A, and pokeweed mitogen than were PBL from normal mink and from mink with a nonprogressive form of AD. Response to the virus of AD was significantly greater in PBL cultures from mink with nonprogressive AD than in those from normal mink or mink with progressive AD. After experimental infection with AD virus, mink PBL were responsive to viral antigen only transiently. These findings suggest that lymphocyte responsiveness as indicated by transformation induced by mitogens or viral antigen may be an important aspect of host response to infection with the parvovirus of AD.

SCIENTIFUR code: 9-M.

Infection and Immunity, Oct. 1981, 111-114. Authors' abstract.

3 tables, 17 references.

CONTRIBUTION TO THE PATHOLOGY OF AMERICAN MINK
UNDER FARM CONDITIONS.

(Prilog patologiji Americkog minka u farmskim uvjetima).

M. Karlović, znanstveni savjetnik, Veterinarski institut, Zagreb.

A report is given about the results of an examination of 502 dead American mink, which were sent to the Veterinary Institute in Zagreb between 1966 and 1975 from seven different large farms. Among the established causes of death one may cite particularly Aujeszky's disease, distemper, salmonellosis (*S. infantis*, *S. typhimurium*, *S. bovis morbificans*, *S. cholerae suis*, *S. heidelberg* and *S. montevideo*), tuberculosis (*M. bovis*), pseudomoniasis, streptococcal and staphylococcal infections, malignant oedema (*Cl. novyi*), necrobacillosis and colibacillosis. Among organic illnesses the first place is taken by gastroenteritis caused by incorrect unsuitable or spoiled food. Catarrhal bronchopneumonia, interstitial nephritis and necrotic hepatitis are less important. One may specially single out mechanical injuries occurring when the animals are caught. Summarizing the results of this ten-year investigation leads us to the conclusion that the majority of mink deaths results from human faults (slaughter house confiscates which have not been previous boiled, fish meal which has not been bacteriologically checked, etc.). To this one may add the considerable oscillation in the momentary demand for furs, which altogether lead to periodical or constant crises or in the end to final cessation of production.

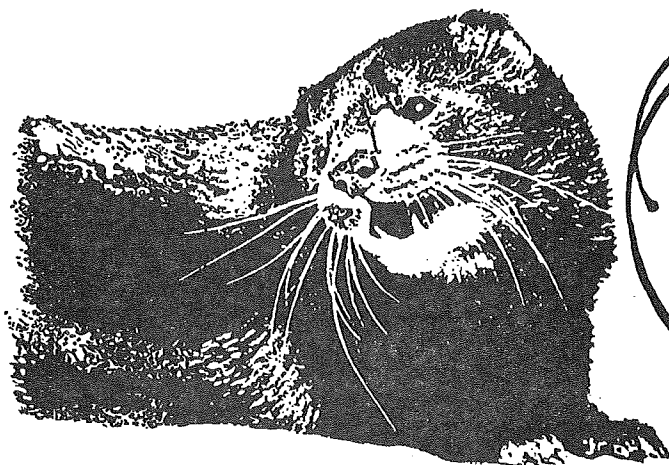
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Veterinarski Glasnik, Savez Veterinara i Veterinarskih Tehnicara Sfrj., 1981, V. 35, 7, 703-707.

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Author's abstract.

In Yugoslav with summaries in English and Russian.



Feed Quality?
Quality Feed!

FIELD STUDIES: PSEUDOMONAS PNEUMONIA OF MINK.

Gerald G. Long, John R. Gorham, Dept. of Veterinary Microbiology, Pathology, and Public Health, Purdue University, West Lafayette, IN 47907, USA.

Epizootics of pneumonia in mink caused by *Pseudomonas aeruginosa* were investigated to characterize the serotype of organisms and to identify possible predisposing factors. Most epizootics were associated with *P. aeruginosa* Fisher serotype 1, and a new one was associated with 3 other serotypes. There were no predisposing factors identified that could be used to differentiate farms affected and those not affected with pseudomonas pneumonia.

Cultural studies indicated that *P. aeruginosa* was present in mink from affected and nonaffected herds. Organisms isolated included serotypes associated with naturally occurring disease. Serostudy results were similar among herds. A prospective field vaccination trial did not yield definitive results, since only slight losses occurred in both vaccinated and nonvaccinated mink. Significant levels of antibody were detected in mink 15 to 17 weeks after they were given a single dose of *P. aeruginosa* lipopolysaccharide vaccine.

SCIENTIFUR code: 9-M.

Am. J. Vet. Res., Vol. 42, No. 12, 2129-2133.

5 tables, 29 references.

Authors' summary.

MINK ENTERITIS IN JAPAN.**I. ISOLATION AND CHARACTERIZATION OF THE CAUSATIVE VIRUS
AND ITS PATHOGENICITY IN CAT.**

Tomoko Higashihara, Hisao Izawa, Misao Onuma, Hiroshi Kodama, Hiroshi Noda, Takeshi Mikami, Dept. of Epizootiology, Fac. of Vet. Med., Hokkaido University, Sapporo 060, Japan.

A virus was isolated from a mink kit which was suffering from infectious diarrhea by direct kidney cell cultures. This virus formed large intranuclear inclusions in the cell cultures of feline origin. Many inclusions were observed when the virus was inoculated on the cells prior to the

formation of cell sheet. The incidence of these inclusions decreased when the virus was inoculated on the complete monolayers. The nucleic acid type of virus is DNA. The virus particle is a sphere with a diameter of approximately 24 nm. It is stable to organic solvents, acid and heat. The virus agglutinated pig, green monkey and crab-eating monkey erythrocytes at 4° C under the condition of pH 6.5 and 6.8. The infectivity of the virus was neutralized with antisera against mink enteritis virus or feline panleukopenia virus. Hemagglutination of the virus was inhibited by the same sera. According to the results of these morphological, physicochemical and serological tests, the virus was identified as mink enteritis virus. Specific pathogen-free cat, which was inoculated with the virus, showed anorexia and vomiting. In the cat, total leukocyte counts decreased significantly and antibodies to the virus were detected. Contact infection was observed.

SCIENTIFUR code: 9-M.

Jpn.J. Vet. Sci., 43, 841-851, 1981.

5 tables, 5 figs., 26 references.

Authors' abstract.

In English with summary in Japanese.

MINK ENTERITIS IN JAPAN. II. EPIDEMIOLOGY OF THE DISEASE.

Tomoko Higashihara, Hisao Izawa, Misao Onuma, Hiroshi Kodama, Takeshi Mikami, Hiroshi Noda, Dept. of Epizootiology, Fac. of Vet. Med., Hokkaido University, Sapporo 060, Japan.

Brief Note.

SCIENTIFUR code: 9-M.

Jpn. J. Vet. Sci., 43, 929-931, 1981.

1 fig., 1 table, 6 references.

In English, only summary in Japanese.

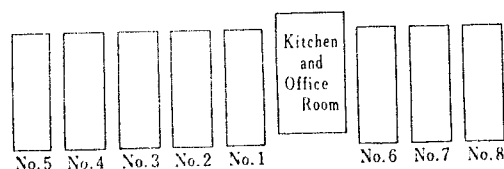


Fig. 1. Arrangement of the houses on K mink ranch.

STUDY OF THE EFFECT OF INFECTION INTENSITY ON THE MORPHOLOGY
OF DYPHILLOBOTHRIMUM LATUM (CESTODA: DIPHYLLOBOTHRIIDAE)
WITH THE USES OF THE RELATIONSHIP ANALYSIS.

ИЗУЧЕНИЕ ВЛИЯНИЯ ИНТЕНСИВНОСТИ ИНВАЗИИ
НА МОРФОЛОГИЮ DYPHYLLOBOTHRIMUM LATUM
(CESTODA: DIPHYLLOBOTHRIIDAE)
С ПРИМЕНЕНИЕМ АНАЛИЗА СВЯЗИ

N.B. Golitzina, V.N. Kharin, L.V. Anikieva, USSR.

The effect of the density of micropopulation on the physiologically different strobile sections of *Dyphyllobothrium latum* was estimated statistically in arctic foxes.

SCIENTIFUR code: 9-F.

Parazitologiya (Leningrad, "Nauka", July/Aug. 1981, V. 15, 4, 313-317.

5 tables, 8 references.

Authors' summary.

In Russian with English summary.

MITRAL VALVE INSUFFICIENCY IN AN ARCTIC FOX.

L. Michael Philo, Donald F. Patterson, James W. Buchanan, Inst. of Arctic Biology, University of Alaska, Fairbanks, Alaska 99701.

A systolic heart murmur was auscultated during a routine physical examination of a 4.5 kg adult male arctic fox (*Alopex lagopus*). The animal had been captured seven years previously and was maintained under natural arctic conditions. There were no clinical signs of congestive heart failure at the time of examination or over the next year. Electrocardiograms and hematologic and blood biochemical tests performed throughout the year had values similar to those of three apparently normal arctic foxes.

One year after detection of the murmur, a detailed cardiovascular examination and necropsy were performed. Phonocardiograms showed a high frequency band-shaped holosystolic murmur. The electrocardiogram was similar to that of a normal dog. Chest radiographs showed slight left atrial enlargement. Angiocardiography and cineangiography revealed regurgitation of contrast medium through the mitral valve. On necropsy, a slightly enlarged left atrium was observed. The mitral valve leaflets contained numerous bullous protrusions containing perforations. These appeared

to be the source of the valvular insufficiency. Microscopically there were focal areas of apparent bacterial endocarditis superimposed on changes typical of chronic degenerative endocardiosis in dogs. It is likely that the organism was a collagenase-producer and that the collagen breakdown led to ballooning and eventual rupture of the valve.

SCIENTIFUR code: 2-9-F.

Publ.: Washington, D.C., USA, Smithsonian Institution Press.

The comparative pathology of zoo animals (edited by R.J. Montali and G. Migaki). Part of a collective document, page 517-521, 1980.

4 figs., 4 references.

Authors' abstract.

ON THE INVESTIGATION OF UNCINARIA (ANCYLOSTOMATIDAE:
UNCINARIA) PARASITES OF SEA BEARS AND POLAR FOXES
FROM THE KOMANDOR ISLANDS.

К ИЗУЧЕНИЮ УНЦИНАРИИ (ANCYLOSTOMATIDAE:
UNCINARIA) —
ПАЗАРИТОВ МОРСКИХ КОТИКОВ И ПЕСЦОВ
КОМАНДОРСКИХ ОСТРОВОВ

S.A. Leonov, N.M. Starostin, Inst. of Biological Problems of the North Far
East Science Centre Acad. Sci., USSR, Magadan.

The biological cycle of the nematode development (Ancylostomatidae *Uncinaria lucasi* Stiles, 1901) caused uncinariosis of sea bears, are described shortly. The differential diagnosis of wide spread parasites of polar foxes, fox dogs and other predators *Uncinaria stenocephala* was realized too. The role of blue foxes as an intermediate host in the infection of sea bears is disclaimed.

SCIENTIFUR code: 9-F.

Publ.: Vladivostok, USSR; Akademiya Nauk SSR, Dal'nevostochnyi nauchnyi tsentr. Paraziticheskie organizmy severo-vostoka Azii.

Part of a collective document, page 170-180, 1975.

6 figs., 16 references.

Authors' abstract.

In Russian with abstract in English.

RACCOON ASCARID LARVAE AS A CAUSE OF FATAL CENTRAL NERVOUS
SYSTEM DISEASE IN SUBHUMAN PRIMATES.

Kevin R. Kazacos, Wendy L. Wirtz, Paul P. Burger, Cathy S. Christmas,
Dept. of Vet. Microbiology, Pathology, and Public Health, Purdue
University, West Lafayette, IN 47907.

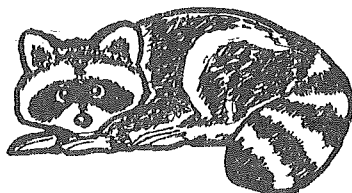
To assess the danger of *Baylisascaris procyonis* (the common roundworm of raccoons) to subhuman primates, as well as the zoonotic potential of the parasite, 4 squirrel monkeys were inoculated by stomach tube with 5,000 or 10,500 infective *B. procyonis* eggs. Fulminating severe CNS disease developed at 10-15 days after inoculation, and the monkeys died or were euthanatized at 12-19 days. At necropsy, numerous hemorrhagic migration tracks were visible in coronal brain slices. Histologically, numerous migration tracks and larvae were seen in the brain as well as the spinal cord. Larvae measured 60.65 μm in midbody diameter. Migration tracks averaged 508 μm x 354 μm in cross section and consisted of foci of malacia and microcavitation, with an influx of macrophages and leukocytes, and various degrees of hemorrhage. Also seen were extensive perivascular cuffing, gliosis, astrocytosis, and a mixed inflammatory cell infiltrate. Numerous larval granulomas were seen grossly and microscopically throughout the body; they were particularly abundant in the tissues of the head, neck, and thorax. It was concluded that *B. procyonis* should be considered a threat to the health of subhuman primates and an important potential zoonosis in situations wherein infection of monkeys or human beings could take place.

SCIENTIFUR code: 9-0.

J.Am.Vet. Med. Ass., Vol. 179, no. 11, 1981.

6 figs., 1 table, 23 references.

Authors' summary.



DUAL INFECTION OF SIBERIAN POLECATS WITH ENCEPHALITOOZON
CUNICULI AND HEPATOOZON MUSTELIS N. SP.

Meliton N. Novilla, James W. Carpenter, Robert P. Kwapien,
Dept. of Pathology, Lilly Research Laboratories, P.O. Box 708,
Greenfield, Indiana 46140.

Seven, 17- to 20-day-old, Siberian polecats (*Mustela eversmanni satunini*) died with clinical signs that included excessive squealing, anorexia, lethargy, purpura, and anemia. Pathologic changes consisted of meningo-encephalitis, focal hepatitis, focal myocarditis, diffuse interstitial pneumonia, and focal nonsuppurative interstitial nephritis. Microsporidian organisms morphologically similar to *Encephalitozoon cuniculi* by light and electron microscopy were associated with these lesions. The organisms were also demonstrated in the spleen, submucosal arterioles of the intestines, and subcutaneous fat. The age of the animals and the nature of the disease suggested a congenital infection. Microsporidiosis due to *E. cuniculi* has been reported in many animals, including some members of the family Mustelidae, but not in the Siberian polecat.

An intercurrent infection with a *Hepatozoon* organism was also observed.

Typical schizogonic stages of *hepatozoon* were found in many areas of the skin as well as the skeletal muscles, heart, liver, kidneys, and mesentery. *Hepatozoon* infections are rarely reported in wild mammals other than rodents, although they apparently occur with some frequency in reptiles. To our knowledge, this represents the first case of *Hepatozoon* sp. in the Siberian polecat, and is only the second report of this parasite occurring in mustelids. Further, this is apparently the first record of schizogonic stages of *Hepatozoon* in the skin, subcutaneous tissue, and kidneys.

It is generally accepted that *Hepatozoon* infections occur by ingestion of infected vector mites, ticks, or other blood-sucking insects. However, the widespread schizogony seen in the skin, with few or no developing stages in visceral organs and bone marrow, suggests that inoculation through the skin could be a route of transmission of this disease. Moreover, the

findings of numerous young and mature schizonts, as well as ruptured schizocysts and free merozoites and gametocytes, indicate that this is the major site of schizogony in the Siberian polecat. Since this is a new host record of a Hepatozoon with site predilection for cutaneous tissues, the name *Hepatozoon mustelis* n.sp. is proposed. The species designation is tentative until its complete life cycle is elucidated. Encephalitozoonosis and hepatozoonosis may have ecological implications for the Mustelidae, particularly for the endangered black-footed ferret (*Mustela nigripes*), probably the rarest mammal in North America.

SCIENTIFUR code: 9-0.

The Comparative Pathology of Zoo Animals: Proceedings of a symposium held at the National Zoological Park, Smithsonian Institution, October 2-4, 1978/Richard J. Montali and George Migaki, editors, with section editors, Kurt Benirschke (et. al.), Washington, D.C.: Smithsonian Institution Press, 1980, 353-363.

15 figs., 1 table, 59 references.

Authors abstract.

THE SPECIFIC HELMINTHS OF RIVERINE BEAVERS AND THEIR CONNECTION WITH THE EVOLUTION OF THE HOST.

СПЕЦИФИЧНЫЕ ГЕЛЬМИНТЫ РЕЧНЫХ БОБРОВ И СВЯЗЬ ИХ С ЭВОЛЮЦИЕЙ ХОЗЯИНА

V.A. Romashov, USSR.

Field experiments showed that 4 of the helminths of the beaver are strictly specific to this host. The beaver, castor fiber migrated from Europe to North America where is speciated into *C. Canadensis*. Of its specific helminths, *stichorchis subtriquetrus* remained morphologically unchanged, *travassosius rufus* gave rise to *T. Americanus* and *castorstrongylus castoris* died out in the beaver in Europe but is found in *C. Canadensis* in North America and in *C. fiber* in Asia.

SCIENTIFUR code: 9-0.

Trudy Voronezhskogo Gosudarstvennogo Zapovednika, 21, 167-173, 1975.

3 figs., 27 references.

CAB-abstract.

In Russian.



FINAL HOSTS OF TOXOPLASMA.

ДЕФИНИТИВНЫЕ ХОЗЯЕВА ТОКСОПЛАЗМ

A.P. Polomoshnov, Inst. of Zool., Acad. of Science of the Kazakh SSR,
Alma-Ata, USSR.

Faecal samples of 10 species of felidae kept at the Alma-Ata Zoo, USSR, were examined for toxoplasma oocysts. *T. gondii* was recorded in *panthera leo*, *acinonyx jubatus* and *felis manul* and also in wild *f. libyca* which are numerous and widespread in Kazakhstan. 2 experimentally infected *f. libyca* passed oocysts from days 4 and 6 of infection for 4 and 24 days, respectively. Maximal numbers were passed on days 2 to 3 of patency. A weak positive response in CFT (1:5) was recorded on day 14 after infection. Both animals became severely ill, one dying 8 days after infection. Domestic dogs, *canis lupus*, *vulpes corsak* and *mustela eversmanni* were susceptible to experimental infection (confirmed by positive CFT reaction and tests in mice) but only as intermediate hosts (none passed oocysts).

SCIENTIFUR code: 9-0.

Alma-Ata, USSR; Akademiya Nauk Kazakhskoi SSR. *Voprosy Prirodnoi Ochagovosti Boleznei*, 10, 68-72, 1979.

9 references.

CAB-abstract.

In Russian.

INTERVERTEBRAN DISC SYNDROME IN A DOMESTIC FERRET.

M.A. Frederick, Monfort Heights Animal Clinic, 5194 North Bend Road,
Cincinnati, Ohio 45211.

A 3-year-old albino, castrated ferret was presented to the clinic with posterior paresis of 12 hours duration. The owners reported that the ferret was unable to use the right rear leg and that the left rear leg was weak. During the examination, I noted flaccid paresis in the right rear leg with hyporeglexia and a weak response to deep pain. Reflexes in the left rear leg were stronger; withdrawal reflex and deep pain reflex were more pronounced than normal. A distended bladder was palpated and easily expressed.

The ferret was sedated with 4 mg xylazine (Rompun^R -Haver-Lockhart) given subcutaneously. Radiographs were taken. In the lateral view, narrowing and collapse of the intervertebral disc space were apparent between the last thoracic and the first lumbar vertebrae.

The owner requested a conservative approach to therapy. The ferret was given 5 mg prednisone (Meticorten^R-Schering) daily and cage rest for three days. Then, the ferret began regaining control of its hindquarters and was released with oral dexamethasone (Azium^R-Schering) to be given daily at a dose of three drops. One week later the animal was walking normally, and therapy was discontinued.

SCIENTIFUR code: 9-0.

Vet. Medicine/Small Animal Clinician, 76, 6, 835, 1981.

Author's report.

APLASTIC ANEMIA ASSOCIATED WITH ESTRUS IN PET FERRETS.

Gary J. Kociba, Cheryl A. Caputo, Dept. of Vet. Pathol., Coll. of Vet. Med.
The Ohio State University, 1925 Coffey Rd., Columbus, OH 43210.

Aplastic anemia in association with estrus was diagnosed in 6 pet ferrets. The ferrets had been examined because of anorexia, depression, and lethargy of 2-5 days' duration. Consistent clinical findings were pale mucous membranes and enlargement of the vulva. Hemorrhages were found in 3 ferrets. Hematologic findings included severe anemia, thrombocytopenia, granulocytopenia, and hypocellularity of the bone marrow. The aplastic anemia was attributed to prolonged estrogenic exposure in ferrets with protracted estrus.

SCIENTIFUR code: 3-5-0.

Journ. of Amer. Vet. Med. Ass., Vol. 178, no. 12, 1981.

2 tables, 10 references.

Authors' summary.



ATTEMPTED EXPERIMENTAL TRANSFER OF SARCOPTIC MANGE
(SARCOPTES SCABIEI, ACARINA: SARCOPTIDAE) AMONG
RED FOX, COYOTE, WOLF AND DOG.

W.M. Samuel, Dept. of Zoology, University of Alberta, Edmonton, Alberta,
Canada T6G 2E9.

Attempts to transfer sarcoptic mange from a red fox (*Vulpes vulpes*), four coyotes (*Canis latrans*), and a wolf (*Canis lupus*) to dogs (*Canis familiaris*) and apparent coyote-dog hybrids were unsuccessful. One coyote died of sarcoptic mange of red fox origin and two coyotes died of sarcoptic mange of coyote origin. Four suspected (i.e., mites were not demonstrated) human cases, all transitory in nature, resulted from handling infested coyotes.

SCIENTIFUR code: 9-F-0.

Journ. of Wildlife Diseases, Vol. 17, No.3, 1981.

1 table, 14 references.

Author's abstract.

IMMUNITY TO RINGWORM IN FURBEARING ANIMALS.

ИММУНИТЕТ ПРИ ТРИХОФИТИИ ПУШНЫХ ЗВЕРЕЙ

L.I. Nikiforov, USSR.

Altogether 112 silver-grey and arctic female foxes were investigated for their immunity from trichophyton mentagrophytes after natural recovery from infection by this pathogen. The animals remained in cages which were not disinfected. In the following year practically puppies from 67 foxes showed symptoms of ringworm. Observations on previously infected foxes during 16 months indicated no clinical symptoms of secondary infection. In experimental infection of 19 out of 112 foxes with virulent str. of *T. mentagrophytes* only allergic reactions were observed, indicating that following natural recovery from this disease foxes developed a stable and strong immunity. Control animals infected by virulent str. developed severe infection.

SCIENTIFUR code: 9-F.

Byulleten' Vsesoyuznogo Ordena Lenina Instituta Eksperimental'noi Veterinarii,
No. 32, 27-28. 1978.

1 table.

CAB-abstract.

In Russian.

TRICHOPHYTOSIS OF SILVER-GREY AND ARCTIC FOXES.

ТРИХОФИТИЯ СЕРЕБРИСТО-ЧЕРНЫХ ЛИСИЦ И ПЕСЦОВ

L.I. Nikiforov, USSR.

Of 198 isolates of dermatophytes from 450 samples of pathological material, collected from furbearing animals in the Soviet Union, 236 (79.2 percent) were *T. gypseum* (*T. mentagrophytes*), 33 (11.1 percent) *T. verrucosum* and 29 (9.7 percent) *microsporum canis*. Animals of all age groups are susceptible to infection by *T. mentagrophytes* and *T. verrucosum*. However, 11/4-2-month-old animals are more frequently infected, mainly during the summer months (June-Aug.). The sources of infection are many, including infected foxes, rodents and litter. The symptoms of infection appear on the snout, ears, and paws, then on digits. In infection by *T. mentagrophytes* nails may also be infected.

SCIENTIFUR code: 9-F.

Bulleten' Vsesoyuznogo Ordena Lenina Instituta Experimental'noi Veterinarii, No. 32, 25-27, 1978.

In Russian.

CAB-abstract.

SPECIFIC PROPHYLAXIS OF TRICHOPHYTOSIS OF FURRED ANIMALS.

**Специфическая профилактика
трихофитии пушных зверей**

A. Kh. Sarkisov, L.I. Nikiforov, All-Union Inst. Exp. Vet. Med., USSR.

Of 514 samples of pathological material from silver foxes, polar foxes and mink 85.54 percent contained trichophyton mentagrophytes, 7.52 percent *T. verrucosum* and 6.94 percent *microsporum canis*. Preventive vaccination with mentavac at 1 ml for silver and polar foxes 1-4 months old and at 2 ml for adults, repeated after 7-19 days, conferred immunity after 21 days. The curative dose was double the amount.

SCIENTIFUR code: 9-M-F.

Veterinariya, Moscow, USSR, No.7, 37-38, 1981.

3 references.

CAB-abstract.

In Russian.

COMMUNICATION

CONGRESS CONCERNING GENETIC AND REPRODUCTION IN FUR BEARING ANIMALS.

Petrozavodsk. 23-26th June 1981.

18.06.82

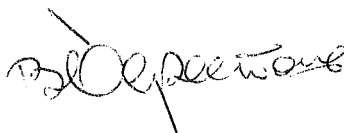
Dear Dr. Jørgensen,

I am very grateful to you for translation and publication of the abstracts from our thematic collected articles "Adaptive reactions of fur-bearing animals" published in the Karelian Branch of the USSR Academy of Sciences in 1980.

Unfortunately, the information on our Congress (Scientifür, vol.6, no 2, p.71-73) was not accurate enough. The fact is that the 3d Scientific Conference on Biology and Pathology of Fur-bearing Animals took place in Petrozavodsk on the 23-26th of June, 1981 but not 1980. Some 200 scientists took part in the work of the Conference. 132 reports on biochemistry, physiology, genetics, breeding, feeding and pathology of fur-bearing animals were made. The abstracts of the reports presented at the Conference were published in Petrozavodsk: Volume I - "Biology and pathology of fur-bearing animals", Petrozavodsk, 1981, p.1-175; Volume II - "Biology and pathology of fur-bearing animals", Petrozavodsk, 1981, p.174-394.

With best personal wishes.

Sincerely yours



V.A. Berestov

Professor

P.S. I am sending you my new book "Laboratory Methods for the Examination of the State of Fur-bearing Animals" with the translation of the contents and summary. Hoping you'll get interested in it.

V.B.

THE YORK CONFERENCE 1982.

As it appears from the following pages The Fur Breeders Association of the United Kingdom & Ireland has held a very successful conference in York on 2, 3, and 4 April 1982 participated of 119 people.

Even that the reports given at the conference are adressed to practise much valuable information is given in the 104 pages of the conference report.

We hope that the 1983 conference will be advertised in SCIENTIFUR so that interested readers can get possibility of participating this famous international conference about fur animal production.

Gunnar Jørgensen

F.B.A. INTERNATIONAL MINK BREEDERS' CONFERENCE REPORT

THE FUR BREEDERS' ASSOCIATION
of the UNITED KINGDOM

SEVENTEENTH TRAINING COURSE

and

CONFERENCE



2nd/3rd/4th April 1982

ROYAL STATION HOTEL, YORK

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67 Upper Thames Street,
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This Report contains all the lectures and discussions which took place at the Seventeenth Training Course and Conference of the Fur Breeders' Association of the UK. The high standard of our York Conference was maintained this year and therefore I am sure you will find the Report both interesting and informative now, and a valuable reference work in the future.

I thank all our speakers for coming, especially those who travelled long distances to be with us. Thanks are also due to the Association secretariat for their hard work behind the scenes which ensured the smooth running of the Conference.

A word of appreciation is due to Mick Hallam and Molly Robins of Janssen Services for the efficient and prompt production of this Report.

Finally, I would like to thank all the delegates, both from the UK and abroad, for coming to York and making the Conference a successful one.

John L. Harbour
Chairman

Fur Breeders' Association of the UK

22/4/82



BOOK REVIEWS

Prof. V.A. Berestov, Dr. Sc. (Vet.)

Honoured scientist of the Russian and Karelian Republics.

Laboratory Methods for the Examination of the State of Fur-bearing Animals.

Publishing House "Karelia", Petrozavodsk, 1981.

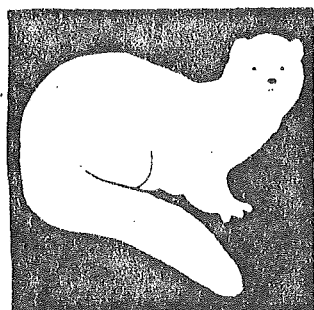
Summary.

The book contains data on the biochemical and morphological composition of mink, fox, polar fox, sable and nutria blood. Possible disturbances of homeostasis are interpreted clinically. Methods of laboratory analysis are described.

The book is intended for use by the workers of diagnostics laboratories, veterinarians, zootechnics and students.

В. А. БЕРЕСТОВ

заслуженный деятель науки РСФСР и КАССР,
доктор ветеринарных наук, профессор



ЛАБОРАТОРНЫЕ МЕТОДЫ ОЦЕНКИ СОСТОЯНИЯ ПУШНЫХ ЗВЕРЕЙ

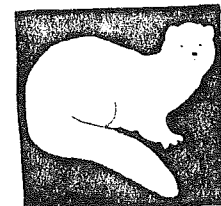
*Благодарю Вас за внимание
к книге и за помощь
автору
В.А. Берестов*

Prof. V.A. Berestov, Dr. Sc. (Vet.)
Honoured scientist of the Russian and Karelian Republics.

Laboratory Methods for the Examination of the State of
Fur-bearing Animals.

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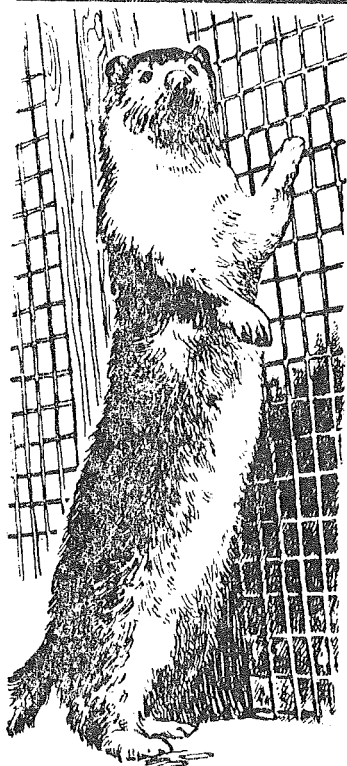
Academy of Sciences of the USSR, Karelian Branch,
Institute of Biology.

V.A. Berestov, L.K. Kozhevnikova.

Blood Enzymes of Fur-bearing Animals.
Leningrad "Nauka", Leningrad Division, 1981.

В. А. БЕРЕСТОВ, Л. К. КОЖЕВНИКОВА

АКАДЕМИЯ НАУК СССР
КАРЕЛЬСКИЙ ФИЛИАЛ
ИНСТИТУТ БИОЛОГИИ



**ФЕРМЕНТЫ
КРОВИ
ПУШНЫХ
ЗВЕРЕЙ**

В. А. БЕРЕСТОВ, Л. К. КОЖЕВНИКОВА

**ФЕРМЕНТЫ
КРОВИ
ПУШНЫХ
ЗВЕРЕЙ**

УДК 636.93 : 591.111.1

Ферменты крови пушных зверей. Берестов В. А., Кожевникова Л. К.
Л., Наука, 1981. 184 с.

Монография посвящена изучению ферментов сыворотки крови пушных зверей, разводимых в современных промышленных комплексах. В ней рассматриваются возрастные и сезонные колебания активности ферментов у здоровых зверей и песцов и нарушения enzymатического статуса сыворотки крови при различных формах патологии. Большое внимание уделено биологическим особенностям пушных зверей, становлению различных функциональных систем в процессе онтогенеза, их сезонной периодичности. С позиций физиолого-экологического подхода обсуждаются видовые отличия в интенсивности обмена веществ и составляющих его ферментативных реакций, специфичность набора множественных форм лактатдегидрогеназы. Лит. — 642 назв., ил. — 33, табл. — 24.

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ЛЕНИНГРАД
«НАУКА»
ЛЕНИНГРАДСКОЕ ОТДЕЛЕНИЕ
1981

Summary.

The monography is concerned with studies on the blood serum enzymes of fur-bearing animals bred in modern industrial complexes. Age and seasonal variations in enzyme activity in healthy mink and polar fox and disturbances in the enzymatic status of blood serum caused by various forms of pathology are discussed. Close attention is given to some biological characteristics of fur-bearing animals, the development of various functional systems during ontogenesis and their seasonal periodicity. A physiolo-ecological approach is employed to discuss specific difference in the intensity of metabolism and its constituent enzymatic reactions, and a specific set of multiple forms of lactata dehydrogenase.

V.A. Berestov, L.K. Kozhevnikova.

Blood Enzymes of Fur-bearing Animals.

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United States-Canadian Tables of Feed Composition

NUTRITIONAL DATA
FOR
UNITED STATES
AND
CANADIAN FEEDS
Third Revision

Subcommittee on Feed Composition
Committee on Animal Nutrition
Board on Agriculture and Renewable Resources
Commission on Natural Resources
National Research Council

NOTICE: The project that is the subject of this report was approved by the Governing Board of the National Research Council, whose members are drawn from the councils of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The members of the committee responsible for the report were chosen for their special competencies and with regard for appropriate balance.

This report has been reviewed by a group other than the authors according to procedures approved by a Report Review Committee consisting of members of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine.

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This study was supported by Agricultural Research, Science and Education Administration of the U.S. Department of Agriculture; by the Bureau of Veterinary Medicine, Food and Drug Administration of the U.S. Department of Health and Human Services; and by Agriculture Canada.

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PREFACE

This report is the third revision of the joint United States-Canadian Tables of Feed Composition. NAS-NRC publication 659, issued in 1959. The first revision, publication 1232 (1964), consolidated the data in the first joint report with selected data from NAS-NRC publication 449 and NAS-NRC publication 585. The second revision was NAS-NRC publication 1684 (1969).

The feeds included here were selected by the Subcommittee on Feed Composition and approved by the Committee on Animal Nutrition and its subcommittees on nutrient requirements of domestic animals. This report brings together analytical data on more than 600 feeds. Data are presented on 68 attributes (nutrients). The report provides working tables for feed manufacturers, nutritional research scientists, teachers, students, county agents, and farmers to use as adjuncts to reports in the *nutrient requirement series*.

This study was partly supported by financial assistance to Utah State University from the U.S. Department of Agriculture (USDA) and from the Agricultural Experiment Station, Utah State University. Support for subcommittee activities was received from Agricultural Research, Science and Education Administration, USDA; the Bureau of Veterinary Medicine, Food and Drug Administration, U.S. Department of Health and Human Services; and Agriculture Canada, Ottawa, Ontario.

The subcommittee wishes to thank the many scientists in commercial and university laboratories who supplied data that have been used in compiling the information contained in this report. We are grateful to the Technical Committee of the USDA Cooperative Regional Project S-45 for providing

data on a number of forages grown in the southeastern section of the United States. Special thanks are due L. C. Kearn, P. V. Fomesbeck, and Howard Lloyd of the International Feedstuffs Institute, Utah State University, for their untiring efforts and special competencies in compiling and organizing the data. We are indebted to Philip Ross and Selma P. Baron of the Board on Agriculture and Renewable Resources for their assistance in the production of this report and to the members of the Committee on Animal Nutrition for their critical reviews and suggestions.

We want to extend our special thanks to Donald L. Bath, Carl E. Coppock, Eugene S. Erwin, Steve Leson, Fredric N. Owens, John V. Shutze, Milton L. Sunde, and Eric W. Swanson who reviewed the draft of the report and made helpful comments and suggestions for our consideration. The report was also reviewed by Bernard S. Schwojert for the Board on Agriculture and Renewable Resources and by Howard S. Teague for the Commission on Natural Resources.

Subcommittee on Feed Composition

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CHARLES W. DEYOE, Kansas State University
LOBIN E. HARRIS, Utah State University
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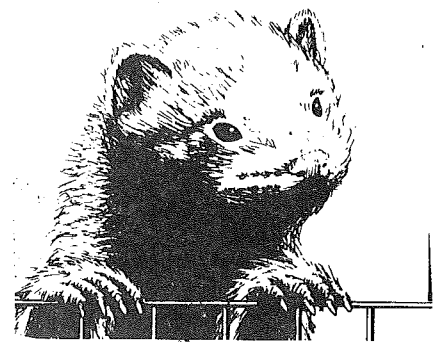
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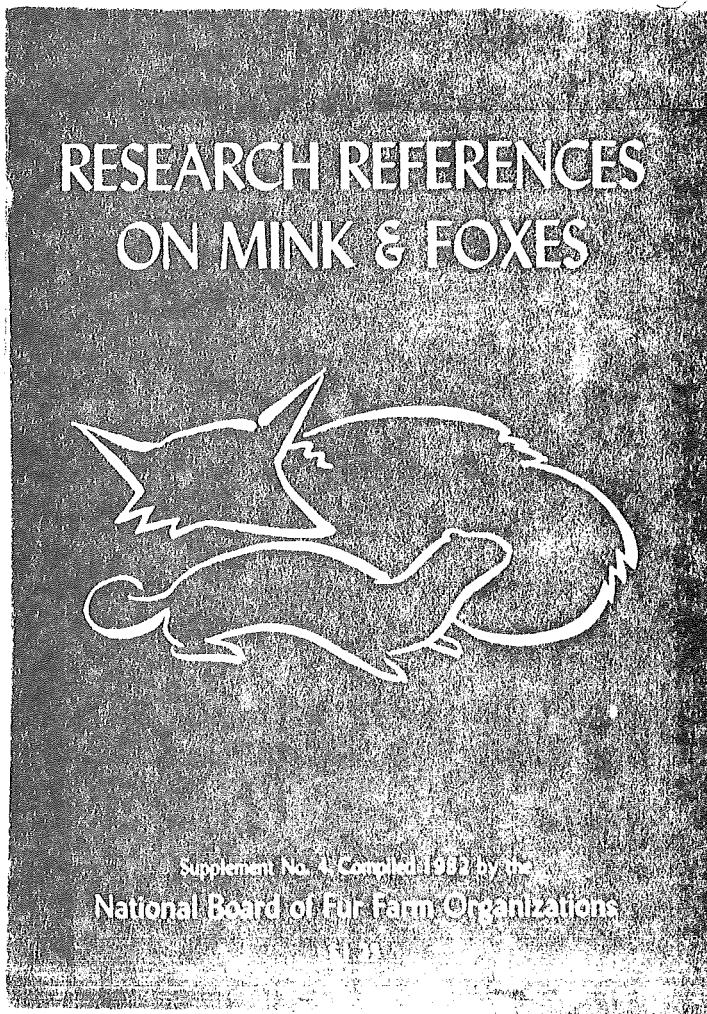
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An Updated Bibliography of the Chediak-Higashi Syndrome of Man and Animals

Compiled by David J. Prieur

David J. Prieur
Department of Veterinary Microbiology and Pathology
College of Veterinary Medicine
Washington State University
Pullman, Washington 99164

Washington State University • 1982

PREFACE

This updated bibliography is an attempt to bring together the widely scattered references pertaining to the Chediak-Higashi syndrome (CHS).

The CHS is an intriguing autosomal recessive genetic disease that has been reported in six species; man, mink, cattle, mice, killer whales, and cats. Even though the disease is rare in man with less than 100 reported cases, a measure of the interest in the syndrome can be demonstrated by the 585 references in this bibliography that pertain directly to CHS. A previous bibliography of CHS was published in 1965 by Cajdusek and Fuge (G01) and listed 59 references. The previous edition of this bibliography (P38) published in 1976 listed 287 references. In the six years since the last bibliography on CHS several areas of investigation utilizing CHS cells have grown extensively. Studies of natural killer (NK) cells of CHS mice, which lack NK activity, account for many of the more recent publications on CHS. Studies on mast cells and platelets have also contributed to the increase in total publications on CHS. Additionally, studies on other topics have contributed to this increase.

One item deserving clarification is the relationship between CHS of mink and Aleutian disease of mink. The CHS is a genetic disease and Aleutian disease is caused by a virus. Most of the confusion concerning these diseases has arisen because the gene for CHS in mink has been termed the Aleutian gene. Therefore mink homozygous for the Aleutian gene have CHS. As a further clarification CHS mink are also sometimes called blue or Sapphire mink and non-CHS mink are sometimes called dark or Pastel mink.

It should also be pointed out that mice with CHS are called "beige" mice, and that mice with the condition called "slate" in the 1960's, were later shown to be CHS mice.

This is an updated bibliography of CHS and includes the references cited by Gajdusek and Fuge (G01) in their original bibliography, those cited in the previous edition (P38) of this bibliography, and in addition all other references pertaining directly to CHS that could be located in the literature. For the most part the references are cited in the original language, and the style is that of Index Medicus with the addition of periods after abbreviated words. Accent marks are not included in the references in this bibliography.

This bibliography was completed during April 1982. Most of these references were personally verified. Any errors or omissions brought to our attention would be appreciated.

David J. Prieur

WASHINGTON STATE UNIVERSITY
PULLMAN, WASHINGTON 99164-7040

DEPARTMENT OF VETERINARY MICROBIOLOGY AND PATHOLOGY 337 Vet. Sci. Bldg.

July 8, 1982


Dr. Gunnar Jorgensen
NJF's Fur Animal Division
SCIENTIFUR
48 N. Roskildevej
DK-3400 Hilleroed
DENMARK

Dear Gunnar:

My coworker, Dr. David Prieur, has prepared an updated bibliography concerning the Chediak-Higashi syndrome. I thought you might like a copy.

With kind regards,

Sincerely,


John R. Gorham, DVM, PhD
Professor, Veterinary
Microbiology/Pathology

JRS:cts

Enclosure

LETTERS TO THE EDITOR

**INVENEX**

VETERINARY LABORATORIES

P.O. Box 37 Middleton, WI 53562, U.S.A. (608) 836-7611 Telex 26-5408



June 11, 1982

Mr. Gunnar Jorgensen
 NJF's Fur Animal Division,
 SCIENTIFUR
 48 H, Roskildevej
 DK-3400 Hilleroed, DENMARK

Dear Mr. Jorgensen:

Enclosed please find a manuscript for possible inclusion in Scientifur. It summarizes a three day conference held for discussions on Aleutian Disease and Mink Virus Enteritis.

At the conclusion of the conference, considerable interest was expressed for a follow-up meeting at a future date. Since many of the people who attended our conference in Wisconsin will be at the Paris Symposium, I would like to schedule this follow-up meeting for the day prior to the start of the 1984 International Symposium in France. It could be held in a small conference room with 15 to 20 chairs. With proper planning, this meeting might supplement, not compete with the Symposium. Your comments and suggestions will be appreciated.

Could you send me some information regarding the 1984 Symposium.

Sincerely,

Herbert Kammer, Ph.D.
 Product Improvement &
 Development Manager

HK/db

Encl.



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17 June 1982

Mr Gunnar Jorgensen,
NJF's Fur Animal Division,
SCIENTIFUR,
48M, Roskildevej,
DK-3400, Hilleroed,
Denmark.

Dear Mr Jorgensen,

I wonder if you could please help me by publishing this letter in "Scientifur", in order that I may contact the relevant authorities in the field of wild fur animals.

We are attempting to establish a fur industry in New Zealand, using wild stocks of the Australian brush-tailed possum Trichosurus Vulpecula as the basis. This marsupial was liberated in New Zealand about 1840, and there are considerable reserves of the wild population (probably in excess of 20 millions). Until recently, the fur industry consisted of the capture of about 3 million wild pelts each year, but in the last three years there has been an attempt at domesticating the animal.

In the long term we hope to improve the wild pelt by rigorous breeding programmes, but we are trying to maintain a viable industry in the meantime by the capture and penfinishing of the wild animals on an appropriate diet. Over 50% of the wild animals in our region of New Zealand are fourth grades, with 30% thirds, 15% seconds and only 5% firsts, so you can see there is considerable room for improvement.

I feel that the wild pelt is a liability in the penfinishing process, and that if this could be removed, the new coat would be a considerably better one. I can think of two ways in which this can be done;

- (i) By inducing a moult. We cannot use light-cycles because the animals are kept in unlit cages similar to mink farms, but is there some chemical that will induce a moult?
- (ii) By removing the fur with some chemical depilatory agent. Is there any experience with other fur animals in this field?

I would appreciate very much any information that you or your readers have which might be relevant to our problem.

Yours faithfully,

A.W. Keber,
Director,
Experimental Possum Farm.

July 8, 1982.

Dear Professor Gunnar Jørgensen

I received your kind letter from 17 June 1982.

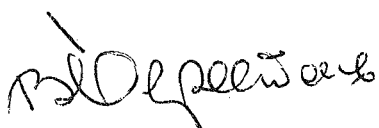
Thank you very much for the attention to our work and for the decision to publish it in SCIENTIFUR. I hope to prepare one more article for your magazine to the end of the year on the mineral composition of fur in minks and polar foxes.

Thank you also for your kind invitation to visit Denmark. I am sorry not to be able to realise my old wish because of great business. I hope that 1983 will be more favourable for foreign tours.

I send you one more book "Blood enzymes of fur-bearing animals" You will soon collect real library of our issues and will be in need of translator from Russian.

With best wishes

Vyacheslav Berestov



Lab. of Physiology of Fur-Bearing
Animals
Inst. of Biol. of the Karelian Branch
of the Acad. of Science of the USSR
II Pushkinskaya St.
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