Husbandry, taming and domestication

Marcus Clauss

Clinic for Zoo Animals, Exotic Pets and Wildlife, Vetsuisse Faculty, University of Zurich, Switzerland

Bio280 Domestication

University of Zurich[UZH]

Clinic of Zoo Animals, Exotic Pets and Wildlife


Siamese war elephants.


HOME COOKED MEALS
CAFE

International Museum of the Horse

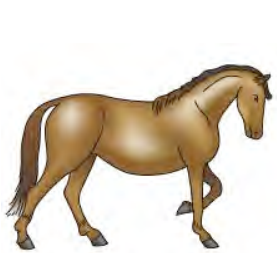

CA ON
OSTR FARM

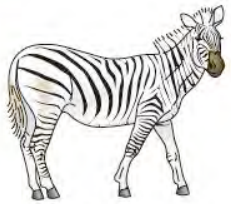
NATURE | VOL 418 | 8 AUGUST 2002

Evolution, consequences and future of plant and animal domestication

Jared Diamond

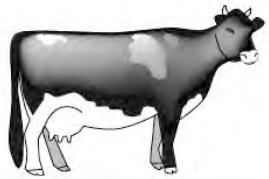
Why so few wild species were domesticated


Horse


Zebra


Reindeer

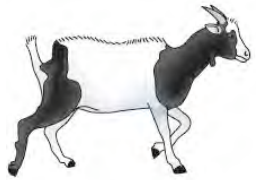

Elk

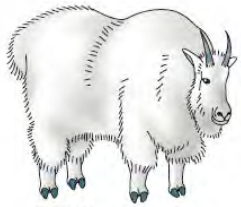

Cow


African buffalo


Sheep


North American bighorn sheep


Goat


Rocky Mountain goat


Cat


Cheetah

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Why so few wild species were domesticated

Friendly nature

No disposition to panic

Accepts hierarchies

Easy to feed

Easy to breed

Short life cycle

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Easy to breed

Short life cycle

Bitte ... zähme mich!

Antoine de Saint-Exupéry aus »Der kleine Prinz«

Taming

Changing

- flight distance
- defensive behaviour
- hunting behaviour
- competitive behaviour
- communication
- cooperation

by imprinting, habituation, training, conditioning ***of individuals***.

Taming is a recognizable skill

Taming

Changing

- flight distance
- defensive behaviour
- hunting behaviour
- competitive behaviour
- communication
- cooperation

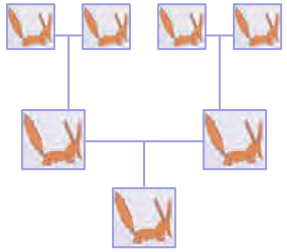
by imprinting, habituation, training, conditioning ***of individuals***.

Domestication

Changing

- flight distance
- defensive behaviour
- hunting behaviour
- competitive behaviour
- communication
- cooperation
- appearance/ anatomy
- productivity
- i.e., ***the genome***

by (intented/ unintended) selective breeding ***of species***.



Domestication is a recognizable skill

Taming

Changing

- flight distance
- defensive behaviour
- hunting behaviour
- competitive behaviour
- communication
- cooperation

by imprinting, habituation, training, conditioning ***of individuals***.

Domestication

is another word for what happens to a population during evolution.

Like evolution will always happen "in the wild", it will automatically happen in any managed system.

by (intented/ unintended) selective breeding ***of species***.


EUROPEAN ASSOCIATION OF ZOOS AND AQUARIA
EAZA

4. Abschnitt: Züchten von Tieren

Art. 25 Grundsätze

[1] Das Züchten ist darauf auszurichten, gesunde Tiere zu erhalten, die frei von Eigenschaften und Merkmalen sind, mit denen ihre Würde missachtet wird.[30]

[2] Zuchtziele, die eingeschränkte Organ- und Sinnesfunktionen und Abweichungen vom arttypischen Verhalten zur Folge haben, sind nur dann zulässig, wenn sie ohne das Tier belastende Massnahmen bei Pflege, Haltung oder Fütterung, ohne Eingriffe am Tier und ohne regelmässige medizinische Pflegemassnahmen kompensiert werden können.

no legal restriction / obligation
except welfare aspects

Taming

Changing
- flight distance
- defensive behaviour
- hunting behaviour
- competitive behaviour
- communication
- cooperation

Given resources, you can tame individuals of any species.

by imprinting, habituation, training, conditioning ***of individuals***.

Domestication

Changing
- flight distance
- defensive behaviour
- hunting behaviour
- competitive behaviour
- communication
- cooperation
- appearance/ anatomy
- productivity
- i.e., ***the genome***

Given resources, you can domesticate any species.

by (intented/ unintended) selective breeding ***of species***.

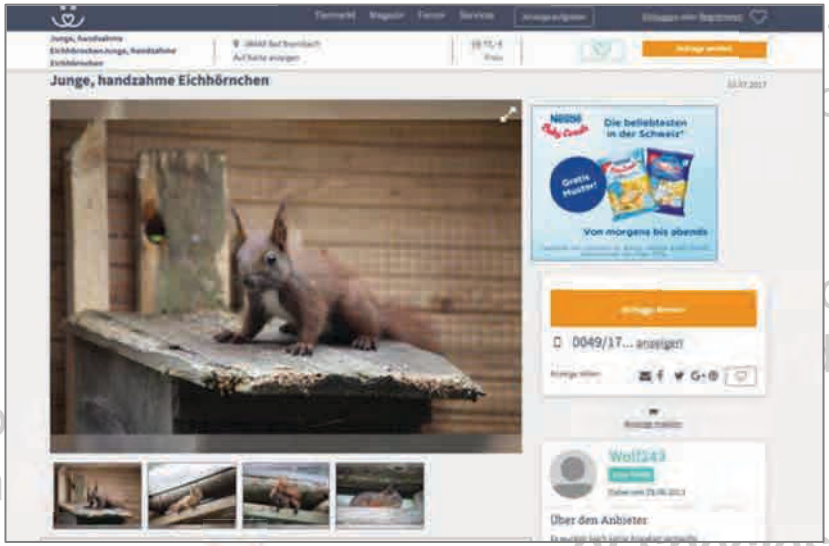
Taming

Given resources, you can tame individuals of any species.

Domestication

Given resources, you can domesticate any species.

... even red squirrels!



Gehege für Säugetiere			Für Gruppen bis zu n Tieren					Für jedes weitere Tier[a]		Besondere Anforderungen
			Anzahl	Aussengehege[a]		Innengehege[a]		Aussen	Innen	
Tierarten			(n)	Fläche[b] m²	Volumen m³	Fläche[b] m²	Volumen m³	m²	m²	
34	Tamandua	c)e)	2	–	–	12	24	–	4	2) 3) 4) 15) 51)
35	Grosser Ameisenbär	c)e)	2	100	–	12	–	10	6	11) 16) 18)
36	Faultiere	c)e)	2	–	–	10	20	–	2	2) 36)
37	Igel, ausser *Erinaceus europaeus*	c)	1	–	–	2	–	–	1	39) 41)
38	Tanrek, kleine Arten mit weniger als 10 cm Körperlänge	c)	1	–	–	0,5	–	–	0,25	2) 39) 41)
39	Tanrek, grosse Arten ab 10 cm Körperlänge	c)	1	–	–	2	–	–	1,0	2) 39) 41)
40	Meerschweinchen, *Cavia porcellus*	d)f)g)	2	–	–	0,5	–	–	0,2	39) 41) 45) 47) 54)
41	Hamster, Mesocricetus sp.	d)	1	–	–	0,18	–	–	0,05	2) 40) 41) 42) 44) 45) 48)
42	Maus, Mus musculus	d)	2	–	–	0,18	–	–	0,05	2) 39) 41) 42) 44) 45) 47)
43	Mongolische Rennmaus (Gerbil)	d)	5	–	–	0,5	–	–	0,05	40) 41) 42) 44) 45) 46) 47)
44	Ratte, Rattus norvegicus	d)	5	–	–	0,5	0,35	–	0,05	39) 41) 42) 44) 45) 47)
45	Degu		5	–	–	0,5	0,35	–	0,2	40) 41) 45) 46) 47)
46	Chinchilla	d)	2	–	–	0,5	0,75	–	0,2	39) 41) 42) 43) 45) 46) 47)
47	Streifenhörnchen		1	–	–	0,5	0,75	–	0,2	2) 39) 41) 42) 43) 48) 50)
48	Erdhörnchen, Borstenhörnchen, Ziesel	c)	5	20	–	–	–	0,6	–	45) 50) Grabschicht 80 cm
49	Eichhörnchen, Schönhörnchen	c)	2	8	20	8	20	2	2	2) 3) 4) 17) 19)
50	Riesenhörnchen, grosse Gleithörnchen	c)	2	–	–	16	40	–	3	2) 3) 15) 17) 19)
51	Quastenstachler, Pinselstachler	c)e)	2	–	–	5	10	–	2	2) 3) 6) 19)
52	Stachelschweine	c)	2	40	–	20	–	4	3	1) 3) 6) 17) 19)

c) Für die private Haltung ist eine Bewilligung nach Artikel 89 notwendig.

2) Klettermöglichkeiten, je nach Art Äste oder Kletterfelsen. Die Astdicke hat den Greiforganen der Tiere zu entsprechen.

3) Schlafboxen. Sie sind der Art entsprechend auf Bodenhöhe oder erhöht anzubringen. Bei zeitweise unverträglichen Arten muss für jedes Tier eine Boxe vorhanden sein.

4) Haltung je nach Art einzeln, paarweise oder in Gruppen. Gehege unterteilbar. Für zusätzliche Tiere sind weitere Gehege erforderlich.

17) Innen- oder Aussengehege. Falls für nicht winterharte Arten Aussengehege vorgesehen sind, ist zusätzlich ein heizbarer Innenraum erforderlich.

19) Regelmässig frische Äste für Zahnpflege und Beschäftigung der Tiere.













Taming

Given resources, you can tame individuals of any species.

Domestication

Given resources, you can domesticate any species.

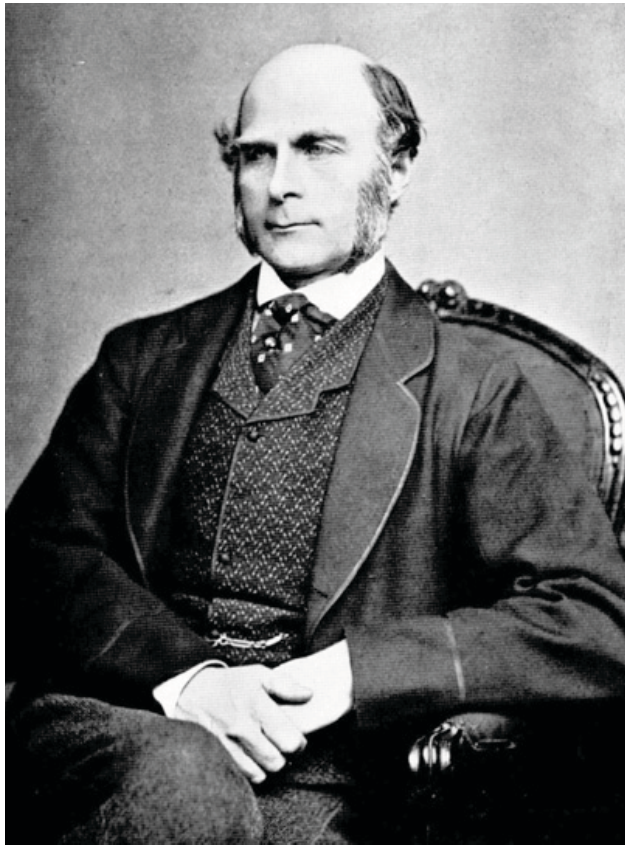
Why so few wild species were domesticated

… because the cost did not appear to outweigh the benefit

XII.—*The First Steps towards the Domestication of Animals.*

By Francis Galton, F.R.S.

No animal is fitted for domestication unless it fulfils certain *stringent conditions*, which I will endeavour to state and to discuss. My conclusion is, that all domesticable animals of any note, have long ago fallen under the yoke of man.



GALTON, F 1865. The first steps towards the domestication of animals. *Transactions ethnological Society London*, N.S. 3: 122–138

GALTON, F 1865. The first steps towards the domestication of animals. *Transactions ethnological Society London*, N.S. 3: 122–138.

insight review articles

Evolution, consequences and future of plant and animal domestication

Jared Diamond

Taming

'likes' humans	Friendly nature
'likes' comfort	
	Accepts hierarchies
Easy to keep	No disposition to panic
	Easy to feed
Robust health and psyche	
Easy to breed	Easy to breed Short life cycle

Domesticating

Useful for humans → *Why domestication ?*

GALTON, F 1865. The first steps towards the domestication of animals. *Transactions ethnological Society London*, N.S. 3: 122–138.

insight review articles

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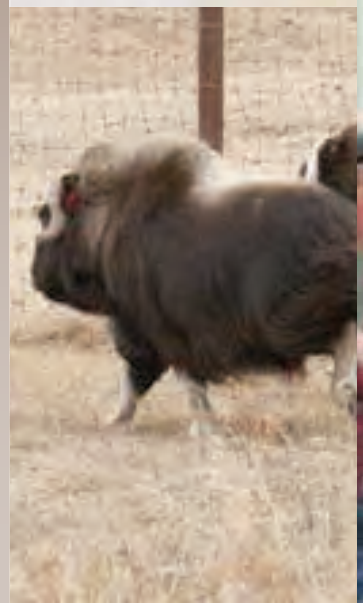
	Easy to feed
Robust health and psyche	
Easy to breed	Easy to breed Short life cycle

Domesticating

Useful for humans → *With any successfully domesticated species, it becomes less likely that another species is domesticated for the same purpose.*


THE NATURE OF



DEVELOPMENT THROUGH THE DOMESTICATION OF ANIMALS: THE CASE OF THE MUSK OX AND THE ELAND

James L. Kelly

In recent years a determined effort has been made to domesticate new animals with most attention focusing on the eland, which is native to the arid and semi-arid areas of southern and eastern Africa, and the musk ox of arctic North America.[1] The underlying purpose of these efforts is to develop lands that are currently either poorly used or not used at all. The natural habitats of the musk ox and the eland are areas plagued by cold temperatures or aridity. These regions have resisted man's attempts at agriculture. Even grazing of domestic livestock has been difficult because of harsh temperatures, lack of suitable vegetation, lack of water, or because of disease. The proponents of domestication argue that a native, wild, animal is naturally adapted to these harsh environments and can survive on the natural vegetation. Thus, it is reasoned that domestication of such animals can help establish some sort of agricultural endeavor in these under-used areas that would otherwise be impossible. The proponents of domestication of such animals are enthusiastic, however, several problems may limit the success of newly domesticated animals. The purpose of this paper is to, first, review the rationale behind attempts to domesticate the musk ox and the eland, and, secondly, to discuss some important problems that should be considered before jumping on the domestication bandwagon.

Mr. Kelly is a Geography graduate student at the University of Kansas, Lawrence.

odi Wildlife Policy Briefing

Number 9, December 2004

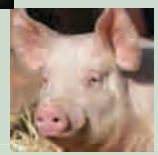
Captive breeding of wild species – a sceptical view of the prospects

Jonathan Rushton, Rommy Viscarra, Cecilia Viscarra, Frederick Basset, Rene Baptista, Corsino Huallata and David Brown

Box 1: Production parameters of Capybara, Collared Peccary, Paca, Cattle, Pigs and Poultry

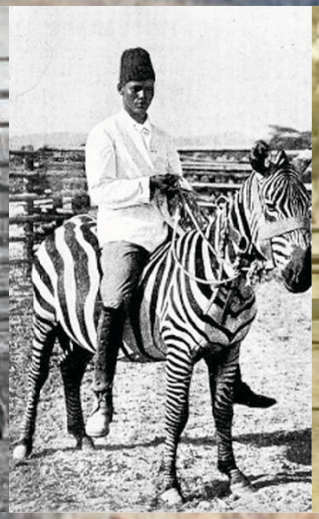
Parameter	Capybara	Collared Peccary	Paca	Cattle in extensive systems*	Pigs in intensive systems*	Poultry in intensive systems*
Costs per kg of production (US$/kg)						
Intensive	1.85	3.46	1.65**		0.49	0.51
Semi-Intensive	1.56	2.37				
Extensive	0.68	2.33		0.65		






* Author estimates ** Based on an estimate of what might be possible rather than a system that has been tested

Low incentive for proactive domestication.
Passive domestication possible when husbandry conditions prevail over many generations.




岐阻路の驛
河渡
長柄川鵜飼船
英泉画
保永堂

TYPES OF MINK

Unicorn Mink offer nine natural colors of ranch raised mink. Each of these colors has is own unique characteristics.

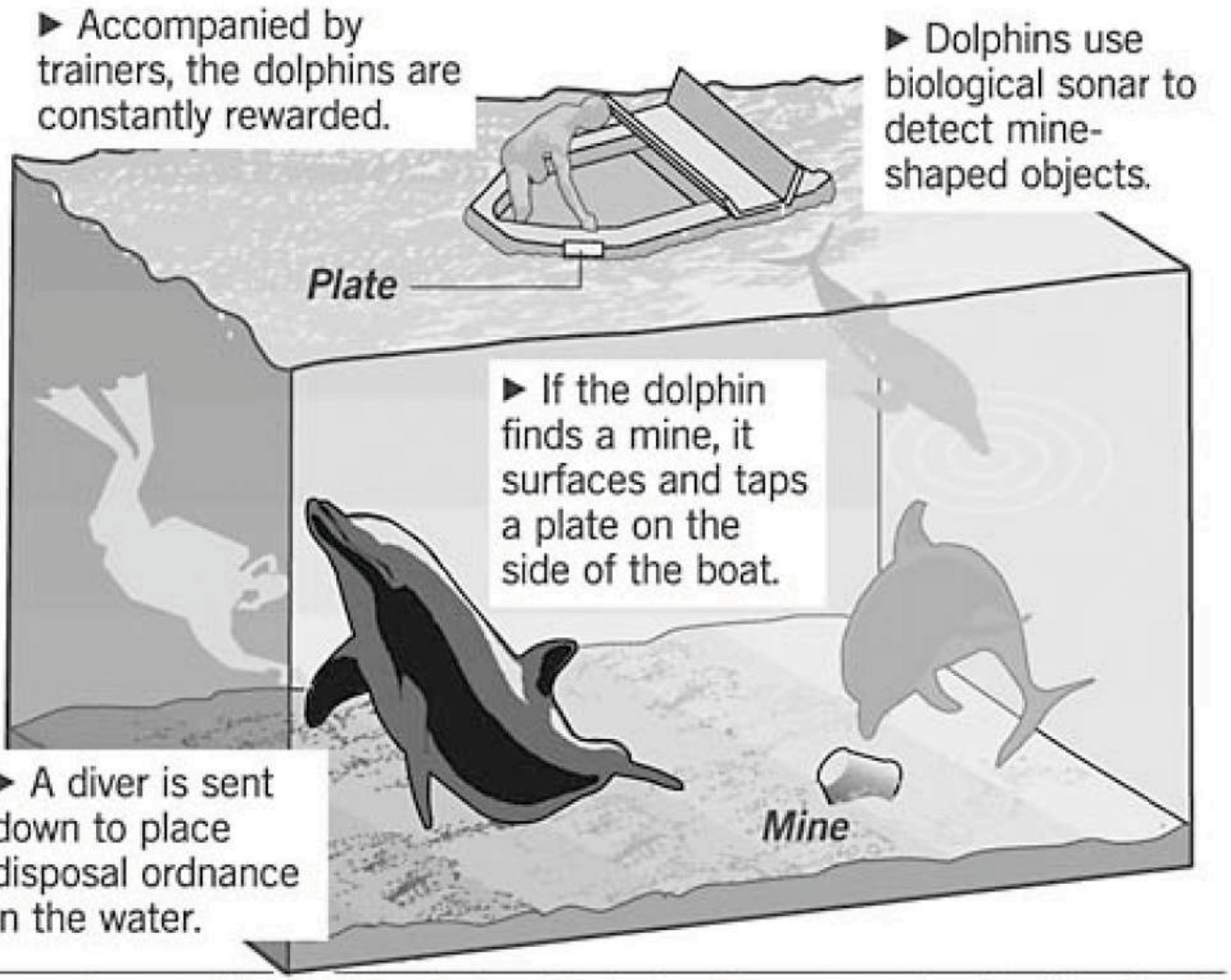
DISCOVER

COLORS

Unicorn Mink offers award winning mink throughout the most popular of natural mink colorations. The diversity of Unicorn farm locations allows for the finest genetic make¬up in each color category. Meticulous animal husbandry practices are applied to maintain the pure bloodlines of the breeding stock.

Dolphins detect mines in Persian Gulf

U.S. Navy helicopters flew two dolphins, Makai and Tacoma, into the Persian Gulf to search for mines ahead of ships that were carrying in relief supplies. These Atlantic bottlenose dolphins can detect mines more quickly than sonar robots or other means.



Source: Space and Naval Warfare Systems Center, San Diego

Associated Press Graphic

It's a dog. It's a cat. No, it's HeroRAT!

Apopo, a non-profit humanitarian organisation, has been deploying african giant pouched rats in mine detection operations since 2014. These trained rodents – dubbed HeroRATS – are cheaper and much more adept at sniffing out TNT than dogs or humans armed with metal detectors. Mine-free land equates to peace of mind to people in countries such as Cambodia who depend on it for sustenance.

'MINE-BOGGLING' FACTS

About 60 countries
in the world are still plagued by landmines and other residual explosives.

More than 105,000
landmines and unexploded ordnance cleared in Tanzania, Mozambique, Angola, Cambodia and Thailand since Apopo's founding in 1997.

THE MINE SQUAD

Length of a rat (includes its tail, which makes up half its length) **Up to 90cm long**

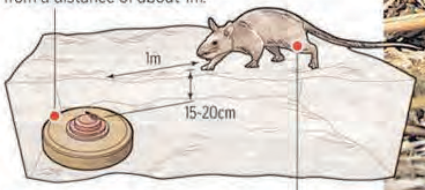
Training commences when they are **around 5 weeks old**

Duration of training: **About 9 months**

All in a day's work

The rats are able to detect:

- Both metal and plastic-cased landmines
- Landmines buried 15cm to 20cm underground.
- TNT in low concentrations and the smell of it from a distance of about 1m.



- Rats will scratch on the ground.
- Mines will then be checked and cleared by a manual demining team.

NOTE: Drawing is not to scale.

WHY THE GIANT AFRICAN POUCHED RAT (CRICETOMYS GAMBIANUS)

No humans, or rats, working with Apopo have lost their lives on the job.

- At about 0.9kg to 1.4kg, it's light enough to scamper over buried mines without setting them off.
- Intelligent and has an acute sense of smell to rival that of dogs.
- Calm and docile temperament.
- Cheap and easy to breed and maintain.
- Can work in the field for up to five years.

■ = 20 minutes

20 minutes
The time taken for a rat to search over an area of up to 200 sq m

Up to 4 days*
The time needed for a technician with a metal detector to comb the same area

NOTE: *Depending on the amount of scrap metal lying around.

■ = One month

About 9 months
to train and certify a rat to detect landmines.

About 2 years
to train a mine-detecting dog and **costs 10 times as much**

THE MAKING OF A HERO RAT

How the rats are trained to detect mines over a nine-month period.

1 Socialisation
The rats interact with people and are exposed to various stimuli within the first few weeks of birth.

2 Scent conditioning
- Trainee rats are conditioned to relate click sounds with food rewards.
- They are then drilled to pick up TNT scents – only then will they get a food reward.

3 Scent discrimination
- Various scents are placed under three sniffer holes.
- A click sound, as well as food incentive, will be issued only when it stops at the hole with the target scent. Repeat training reinforces the correlation.

4 Soil floor search
- The training extends to locating the hidden target scent in a sandbox.
- The tethered rat learns to walk in marked lanes and return to its trainer for food reward after each successful search.

5 On-the-job training
- The rats are released into a field with de-activated landmines.
- Training steps up from detecting surface-laid mines in small areas to mines buried deep underground in larger land plots.

6 Final test and accreditation
The rats are put through a test with standards surpassing those in the International Mine Action Standards.

SOURCES: APOPO, NATIONAL GEOGRAPHIC, NEW YORK POST
PHOTO: APOPO STRAITS TIMES GRAPHICS: LIM YONG


apopo


COMFORT DOG MINISTRY
LUTHERAN CHURCH CHARITIES


DON'T PET ME,
I'M WORKING


Maltese(Blue)
Fairy Swallow
Maltese(yellow)
Jacobin(Almond)
Hungarian(Ash yellow)
Stresser(Blue spangle)
Frillback(Red)
Rodena Blue
Longhead(Black)
Stresser(Blue)
Swallow(Yellow Spangle)
King(White)
Jacobin(Yellow)
Jacobin(Red)
Stresser(yellow)
05717-8622002
Polish Lynx
Stripd Shell(Blue)
Stresser(Black)
Dutch Helmet
Mondain(White)
Berbo shell Faced
House Pigeon(white)
Mondain(Red)
Saxon shield(Red)
Mondain(Ash Red)
King(Blue)
Mondain(Black)
Nicobar
Beauty Homer
Starling
Swift(Red)
Spanish Flemish
Swift(Black)
Yellow Brest pigeon
Barb(Black)
Mondain
Lahore(Yellow)
05717-8622002
Mukee(Red)
Moorhead(Blue)
Beauty Homer
Jacobin(Almond)
Mukee(Dun)
Archangel
Lahore(Blue)
Archangel
Archangel
Fantail(Aparajita)
Longhead(Yellow)
Owl


Cats of the World

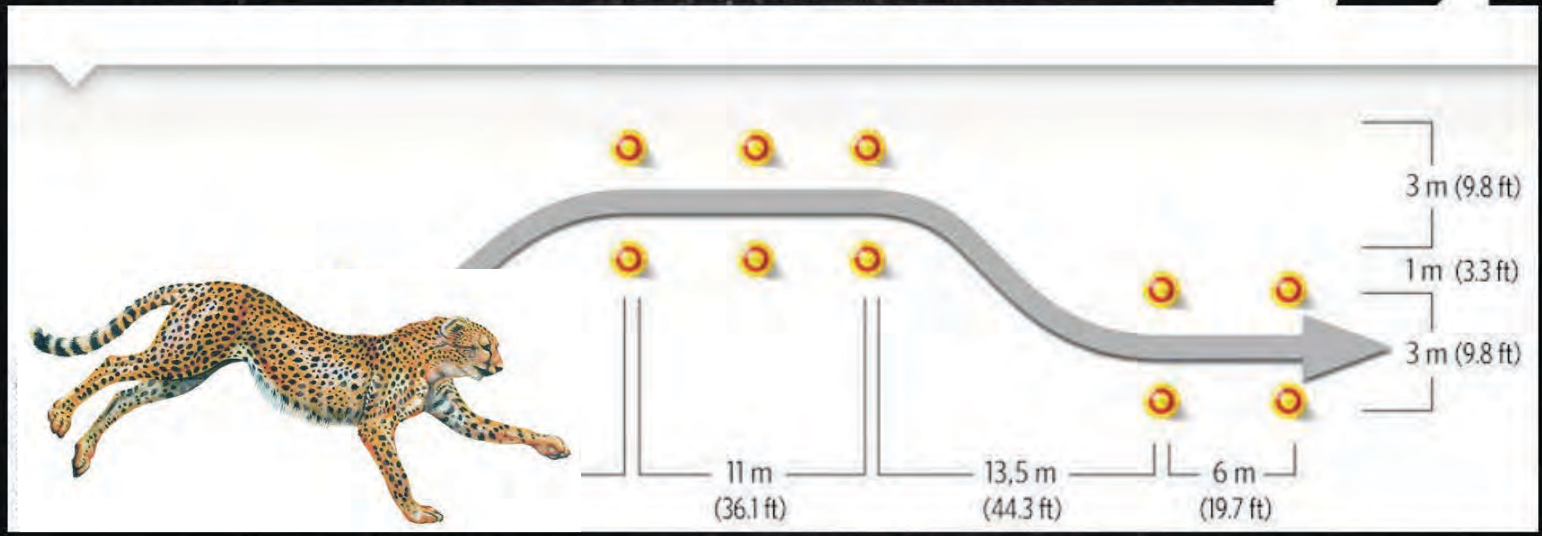

Breeds of Rabbits
BEVEREN
CONTINENTAL GIANT
FLEMISH GIANT
BELGIAN HARE
ENGLISH
GIANT CHINCHILLA
NETHERLAND DWARF
DUTCH
DWARF LOP BLUE
ENGLISH LOP
DWARF LOP FAWN
DUTCH
LION HEAD
MINI LOP
HAVANA
POLISH
SILVER FOX
NEW ZEALAND WHITE
TAN
REX
THURINGER
NETHERLAND DWARF
NEW ZEALAND RED


GinRin Kohaku
Asagi
Bekko
Doitsu
Kohaku
Goshiki
Hikari
Kawarimono
Gin Matsuba
Goromo
Kujaku
Kumonryu
Ochiba
Platinum Ogon
Orenji Ogon
Sanke
Shusui
Showa
Tancho Sanke
Tancho
Yamabuki Ogon
Utsuri


CHICKEN
breeds
Orlet

Elchtest

Aufbauschema



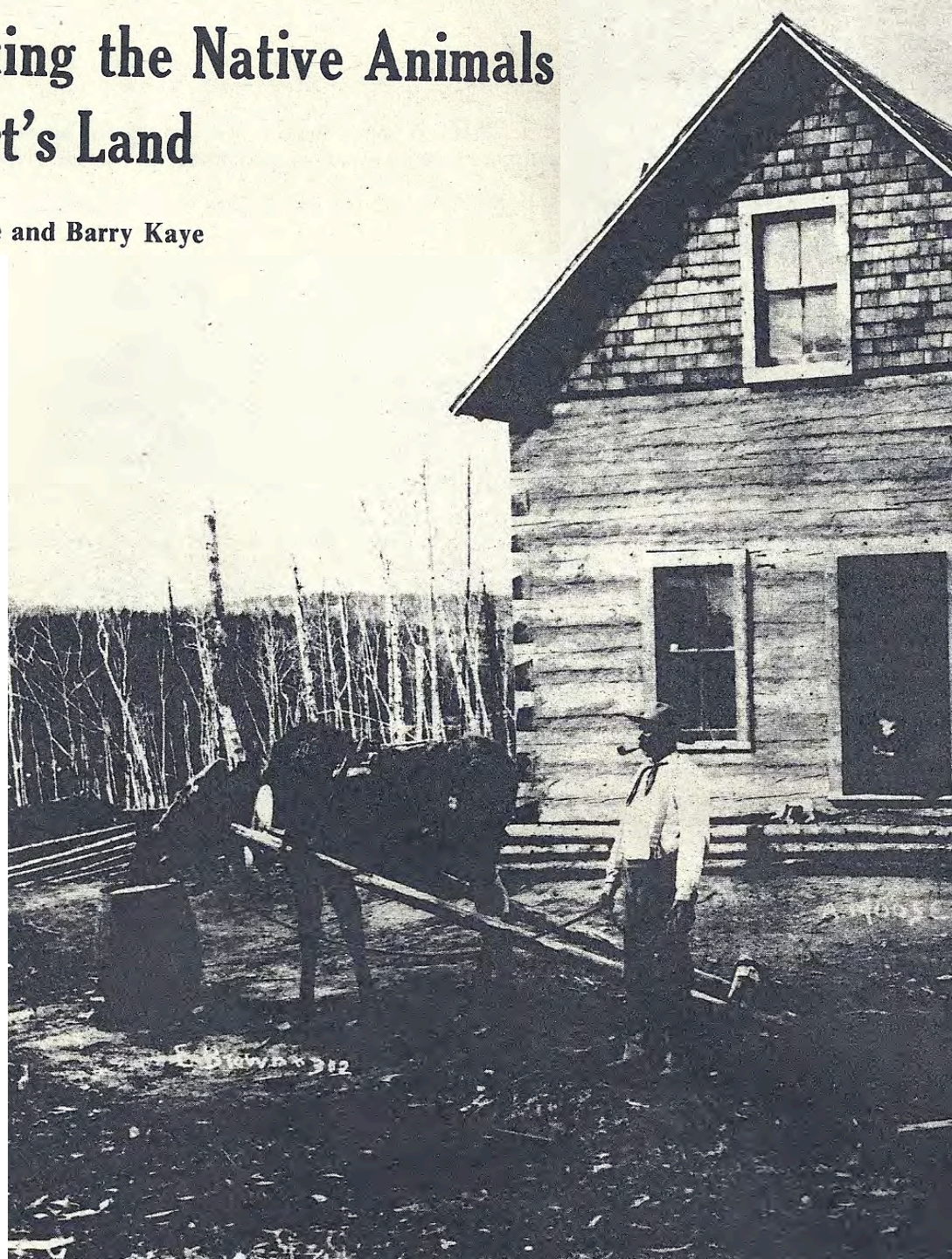
Elche als Haustiere

Von N. v. Transehe, Gut Osiny (Wartheland)

Eingeg. 15. März 1941

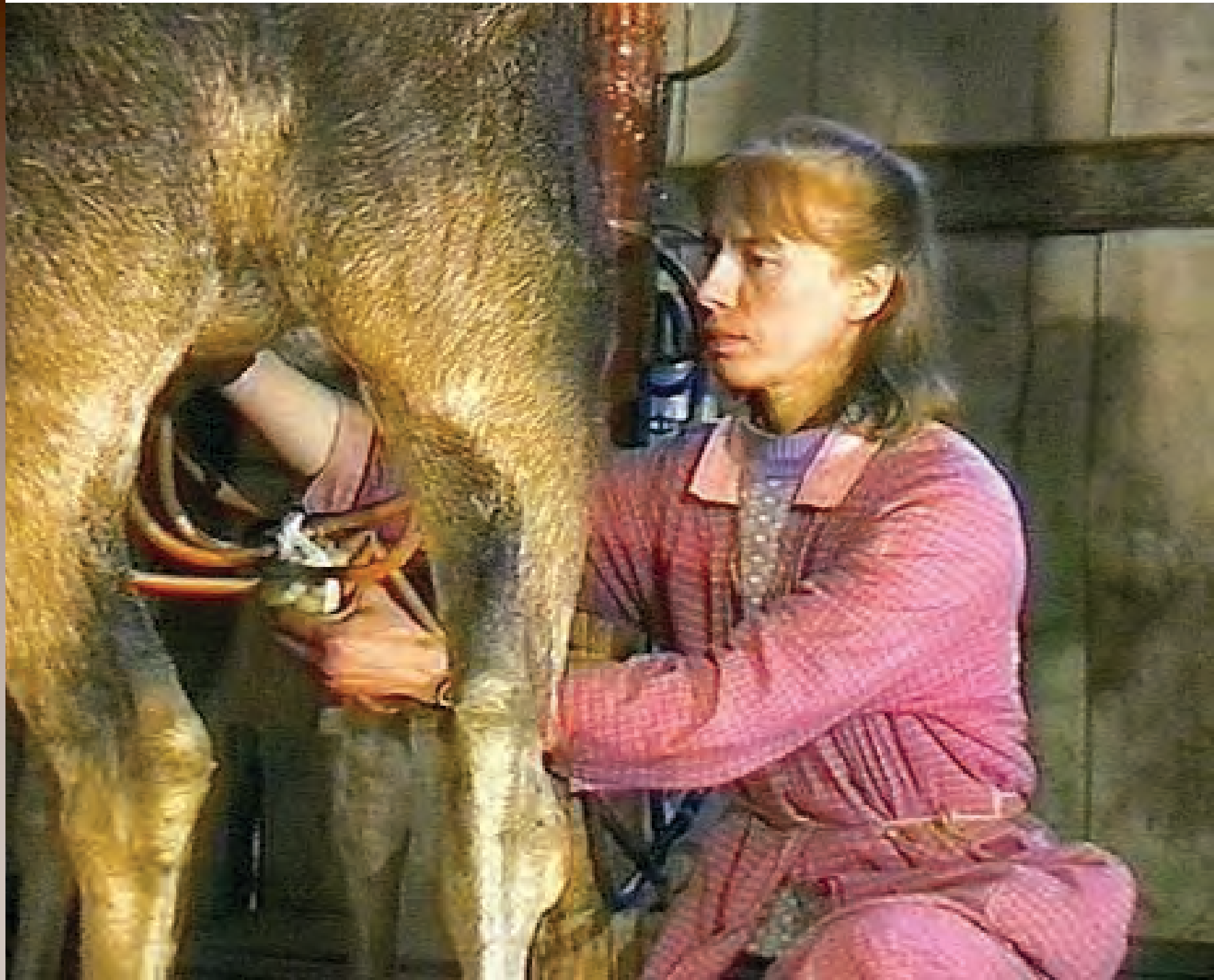
Taming and Domesticating the Native Animals of Rupert's Land

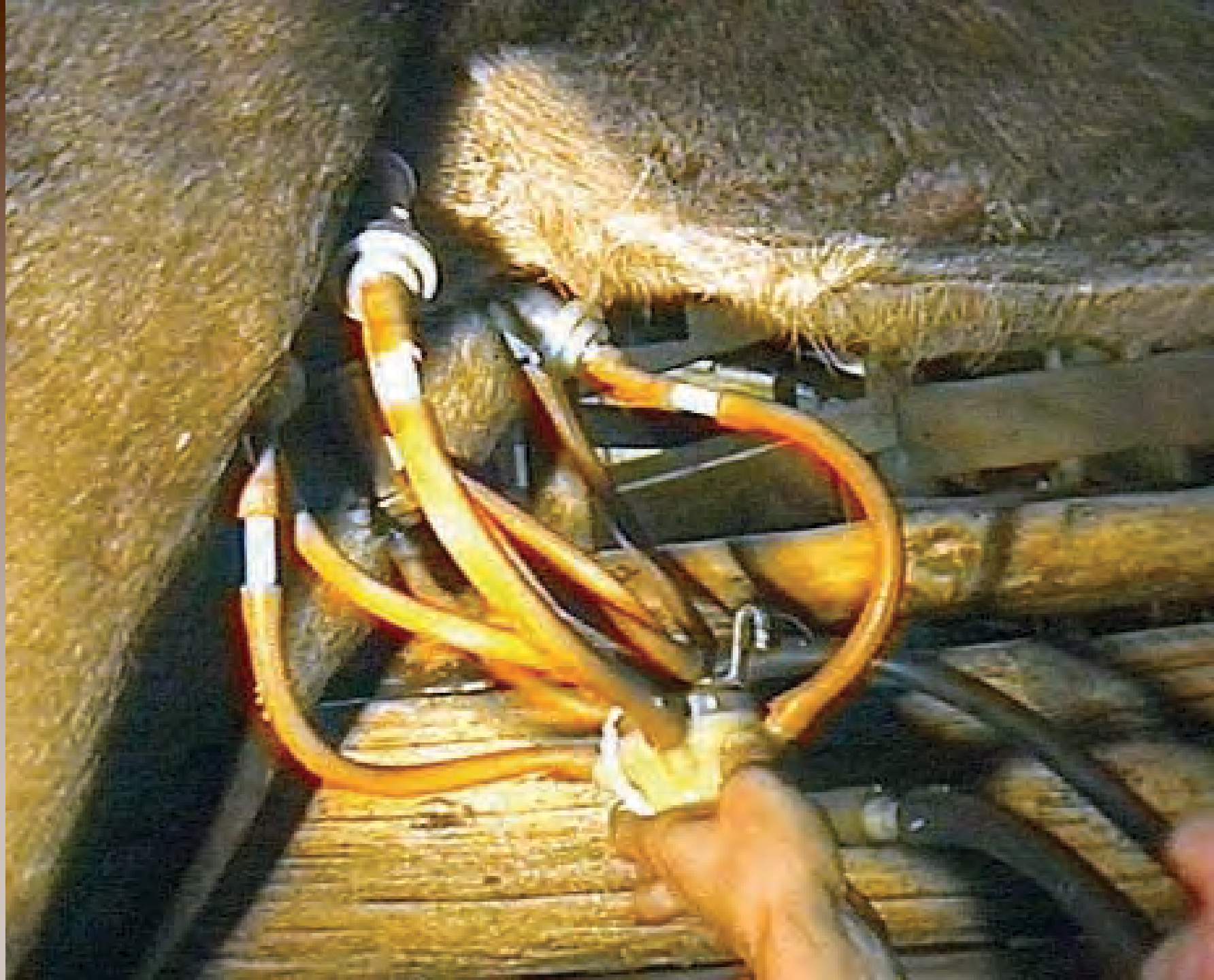
By D. W. Moodie and Barry Kaye




Domesticated Moose
2 years Old
Nipawin Sask.


ЛОСИНАЯ
ФЕРМА





“Elchtest”

“Elchtest”

Useful for humans?

“Elchtest”

?

Useful for humans?

?

‘likes’ humans
Friendly nature
Accepts hierarchies

“Elchtest”

?

Useful for humans?

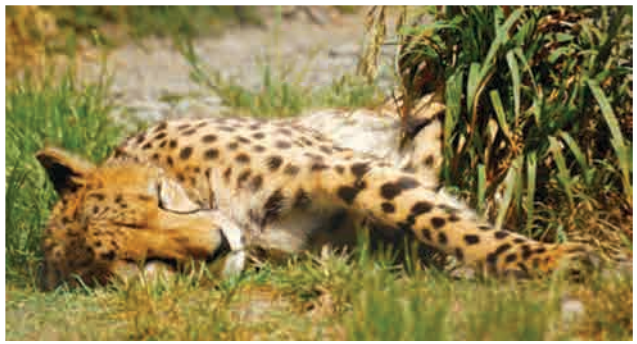
?

✓

‘likes’ humans
Friendly nature
Accepts hierarchies

✓

‘likes’ comfort

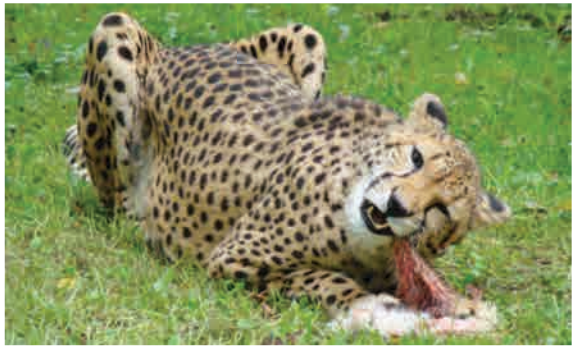


“Elchtest”

?	*Useful for humans?*	?
✓	*‘likes’* humans Friendly nature Accepts hierarchies	✓
✓	*‘likes’* comfort	✓
	No disposition to panic	

“Elchtest”

?	*Useful for humans?*	?
✓	*‘likes’* humans Friendly nature Accepts hierarchies	✓
✓	*‘likes’* comfort	✓
✓	No disposition to panic	✓
✓	Short life cycle	✓
	Easy to feed	



Elchtest

?	*Useful for humans?*	?
✓	*'likes'* humans Friendly nature Accepts hierarchies	✓
✓	*'likes'* comfort	✓
✓	No disposition to panic	✓
✓	Short life cycle	✓
	Easy to feed	✓

“Elchtest”

?	*Useful for humans?*	?
✓	*‘likes’* humans Friendly nature Accepts hierarchies	✓
✓	*‘likes’* comfort	✓
✓	No disposition to panic	✓
✓	Short life cycle	✓
✗	Easy to feed	✓
	Easy to keep	

“Elchtest”

?	*Useful for humans?*	?
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✓	No disposition to panic	✓
✓	Short life cycle	✓
✗	Easy to feed	✓
	Easy to keep	

“Elchtest”

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✓	No disposition to panic	✓
✓	Short life cycle	✓
✗	Easy to feed	✓
?	Easy to keep Accepts hierarchies Robust health / psyche	?

“Elchtest”

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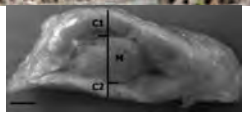
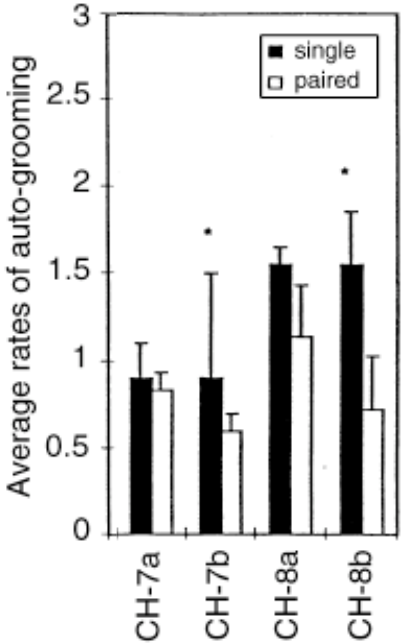
✓	*‘likes’* comfort	✓
✓	No disposition to panic	✓
✓	Short life cycle	✓
✗	Easy to feed	✓
?	Easy to keep	?
✗	Accepts hierarchies Robust health / psyche	
✗	Easy to breed	

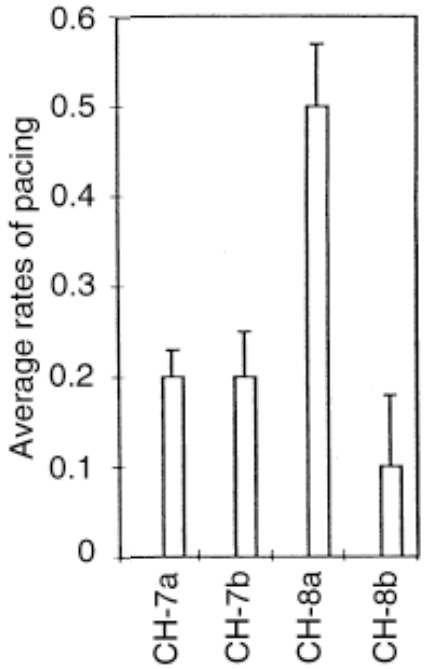


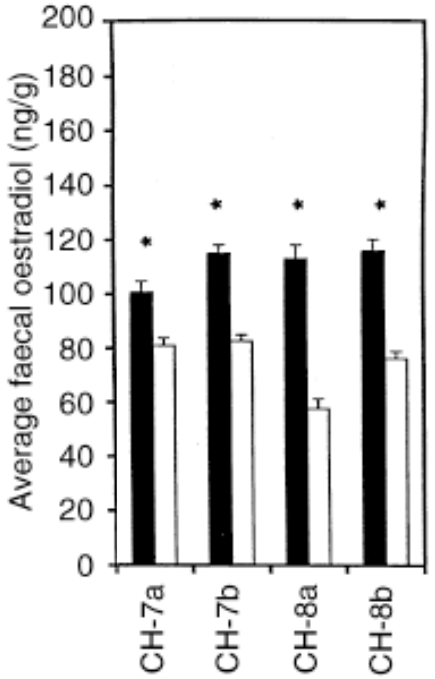
Impact of social management on reproductive, adrenal and behavioural activity in the cheetah (*Acinonyx jubatus*)

Nadja C. Wielebnowski[1], Karen Ziegler[2], David E. Wildt[1], John Lukas[2] and Janine L. Brown[1]

Animal Conservation (2002) 5, 291–301







“Elchtest”

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✓	*‘likes’* comfort	✓
✓	No disposition to panic	✓
✓	Short life cycle	✓
✗	Easy to feed	✓
?	Easy to keep Accepts hierarchies	?
✗	Robust health / psyche	✗
✗	Easy to breed	✗

Elche als Haustiere

Von N. v. Transehe, Gut Osiny (Wartheland)

?	***Useful for humans?***	?
✓	***'likes'* humans** **Friendly nature** **Accepts hierarchies**	✓
✓	***'likes'* comfort**	✓
✓	**No disposition to panic**	✓
✓	**Short life cycle**	✓
✗	**Easy to feed**	✓
?	**Easy to keep**	?
✗	**Accepts hierarchies** **Robust health / psyche**	✗
✗	**Easy to breed**	✗

Der Elch (*Alces alces* L. 1758) als Haustier?

Von Peter Krott, Kleinsölk/Steiermark

Mit 8 Abbildungen

Eingeg. 6. Jan. 1958

MOOSE DOMESTICATION EXPERIENCE

By LEONID M. BASKIN

Baskin, L. M. Moose domestication experience.—Swedish Wildlife Research, Suppl. 1, 1987: 741–743.

Experiments on moose domestication conducted in the USSR for over 40 years have failed to bring about changes typical of domestication: i.e. in dimensions, coloration and breeding rhythms. A possible reason is the use for breeding of wild bulls along with cows that are being domesticated. Strong possibilities for changing the attitude of moose to man is interference in behaviour ontogenesis: calf imprinting (up to ten days of age) of a man as mother while being fed on milk. This leads to further social attachment to man, manifestation of sexual behaviour on the part of the males and motherly behaviour on the part of females, including permission of being milked. Imprinting of man as an environmental positive social factor is possible until the calf is three months old, or, at most, one year old. Attempts to develop herding behaviour have failed, as well as management based on the defensive reflex. Moose remain in the surroundings of the farm where they were raised because of attachment to the habitat area. At the present time, domestication may be aimed at assembling moose at logging waste sites and obtaining milk with its alleged medicinal effect. The intuition-based approach (creation of moose similar in behaviour to domestic livestock) is through a scientifically regulated evolutionary process of domestication.

L. M. Baskin, Institute of Evolutionary Animal Morphology and Ecology, USSR Academy of Sciences, 33 Leninsky Prospekt, 117071 Moscow, USSR.

What we do with animals

Keeping wild animals (habituation)

Taming of individuals

Systematic taming of wild animals

Domestication by (unintended /deliberate) selective breeding

Thank you for your attention