



Feeding zoo animals to zoo carnivores is an ethical problem *if you do not do it*



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University of
Zurich^{UZH}



Clinic
of Zoo Animals, Exotic Pets and Wildlife



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Concepts of Animal Welfare in Natural Habitats and in Zoos: Meaning and Anxiety

MARCUS CLAUSS, CHRISTIAN SCHIFFMANN

Abstract

While there is ample concern about the welfare of animals kept in zoos, the fact that living in natural habitats exposes animals to constant threats is rarely emphasized. On the contrary, the fact that zoos—advocates of animal welfare—promote conservation, often without stating an explicit reason, gives rise to the notion that “the wild” is the optimal habitat for animals. By allowing this impression, zoos detract from the concept that welfare, most likely, is highest when leading a meaningful life (with the opportunity to make choices that matter) in an anxiety-free environment (where wrong choices do not have fatal consequences)—a condition that is often not achieved in “natural” but in “settings under human care,” by good husbandry. Clearly separating the value of, and reasons for, conservation from animal welfare may lead to a higher esteem of life in good zoos.

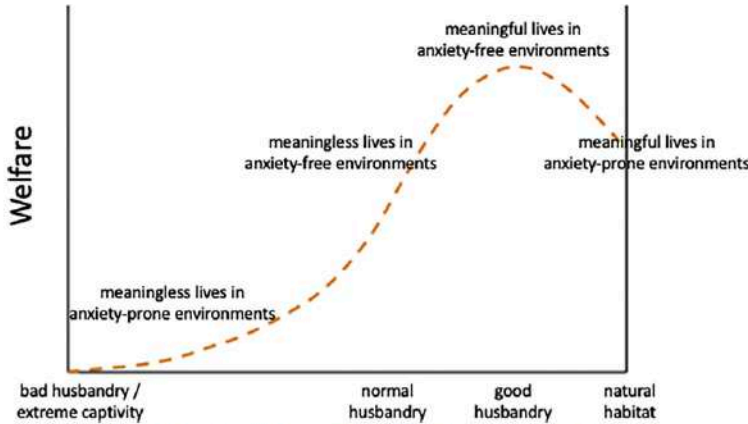
Common rhetoric of the zoo community suggests that zoos are justified, to a large extent, by their ambassador function for biodiversity and habitat conservation, as well as the awareness, funds, expertise, and manpower they generate for these goals.¹ Currently, conservation is the major mission on the websites of the Association of Zoos and Aquariums (AZA),² the European Association of Zoos and Aquaria (EAZA),³ and the World Association of Zoos and Aquariums (WAZA).⁴ The guidelines of AZA actually oblige zoos that seek accreditation to have conservation as part of their mission statement,⁵ and EAZA grants accreditation on the condition that a zoo keeps animals to promote in situ conservation.⁶

This rhetoric has important implications: typically, the reason why conservation should be fostered is not stated, but the context is often a defensive one.⁷ A tradeoff appears intuitive, that it is justified to keep animals in captivity if this situation is for a greater good. When presented in this way, captivity appears as a condition that would not be justified if a greater good was not involved—or, in other words,

a situation not justifiable in itself. Thus even if it may not always be worded explicitly in official statements, the concept may arise that being in a natural habitat is the optimal state for an animal. In our view, this rhetoric and concept romanticize natural habitats and the idea of freedom, and unduly rank life in zoos as second rate at best. By using rhetorical tools, we aim to explain our view that life in a good zoo is second to none, and that there are important reasons for promoting conservation, but that animal welfare is not among them. In doing so, we hope to provide argumentative support for zoo professionals who feel a need for a conceptual framework for their professional life. Inadvertently, this will also address the evident misalignment of the choice of species kept in zoos and conservation statements,⁷ even though that dilemma is not our primary focus. We note that the discrepancy between “animal ethics” and “environmental ethics,” and the discrepancy between the aims of animal welfare and conservation, has a long history.^{8–10} Our thoughts developed largely independent of that literature, which we do not reiterate here.

Freedom and Captivity Are Not Opposites

The assumption that life in captivity is second rate appears implicit in a large body of literature on zoo animal husbandry, nutrition, medicine, and welfare. We consider specific niche conditions to which a species adapted throughout evolution and explain deviations from optimal health and welfare by the deviating conditions in captivity from those of that natural niche. From the effect of substrate on foot health¹¹ to diet- and exercise-related “civilization diseases,”^{12,13} from associations of home range areas with a presumed propensity for locomotion and stereotypes¹⁴ to the effect of group or solitary keeping on welfare,¹⁵ we make comparisons with natural habitats all the time. This approach is so ingrained in zoo medicine that we do not even have an official name for it—quite in contrast to



• Figure 39.1 A concept of the quality of welfare in relation to living conditions, modified from Veasey.¹⁷ Conditions are judged and categorized into “bad,” “normal,” and “good” husbandry by whether the five freedoms may be violated, leading to an anxiety-prone environment, and whether the animals can make choices that affect their circumstances, leading to a meaningful life. The presumably best combination cannot be found in natural habitats. Finding ways of offering animals situations where their choices matter, without creating anxiety, represents the ultimate challenge and aim of professional animal husbandry.

conspecifics.²³ Additionally, the conditions in zoos—conveniently interpreted as safety, or freedom from survival necessities—may allow behaviors that are not expressed in natural habitats. An impressive example is the decreased neophobia, increased exploratory behavior, and innovations of orangutans (*Pongo* spp.) and other primates in human care as compared to free-ranging conspecifics.^{20,31} Increased understanding of animal needs, improving husbandry skills, and efficiency in the use of resources may lead to an increase in zoo animal longevity (and, arguably, welfare) over historical time, indicating progress in the skill of wild animal husbandry.³¹ Again, the orangutan is a showcase example.³² Another example is the finding that the relative longevity of zoo ruminant species is positively affected by the existence of international studbooks,³⁴ which usually contain husbandry guidelines. Contrasted with “bad husbandry,” improved husbandry that achieves the “five freedoms” may be described as *anxiety-free* (see Fig. 39.1). Yet, such a life is possibly still *meaningless*, because the animals again might not be able to make choices that matter for their immediate circumstances. In human terms, this is a life without any suffering except the lack of relevant challenges. It is also often described as boredom,³⁵ and an enormous body of zoo literature is dedicated to “enriching” zoo animals’ lives to relieve this boredom and to prevent stereotypes.^{36,37} Typically, this enrichment can be summarized as finding more complex or complicated ways to guarantee the five

freedoms. Developing enrichment strategies that are based on choices that matter might represent the timely next step.

Providing Meaning

Among the choices animals may make that give “meaning” by affecting their lives, social interactions and reproduction appear as the most intuitive ones. Providing animals with appropriate social systems—unrelated groups, family groups, pairs, or solitary existence with only occasional contact to conspecifics, as appropriate for the species—in which they can make social decisions represents a fundamental step in making their lives “meaningful.” Innovative concepts have been proposed to expand the meaning provided by a social unit to communication with other social units of the same species, for example by remote communication.³⁸ The interaction with other species, in particular with humans, offers another important area for meaningful choices.^{39,40}

Breeding and raising offspring represent important challenges where animals can succeed or fail. Depriving animals of these challenges, for example due to the perception that the production of surplus offspring is ethically unacceptable if that offspring would have to be euthanized, is a serious step.⁴¹ Such a step would require particular effort to compensate for the lost “meaning” opportunity in the form of alternative systems in which the animals can make meaningful decisions. (As an aside, why euthanizing of surplus



Meaningful lives in an anxiety-free environment



Meaningful lives in an anxiety-free environment show us, and remind us of, the beauty and complexity of life.



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Meaningful lives in an anxiety-free environment





Meaningful lives in an anxiety-free environment





Meaningful lives in an anxiety-free environment



for everyone !







no feeding of live animals



Feeding carnivores ...





Feeding carnivores ...





Feeding carnivores ...





Feeding carnivores ...





Feeding carnivores ...





Feeding carnivores ...





Feeding carnivores ...





Feeding carnivores ... with animal (product)



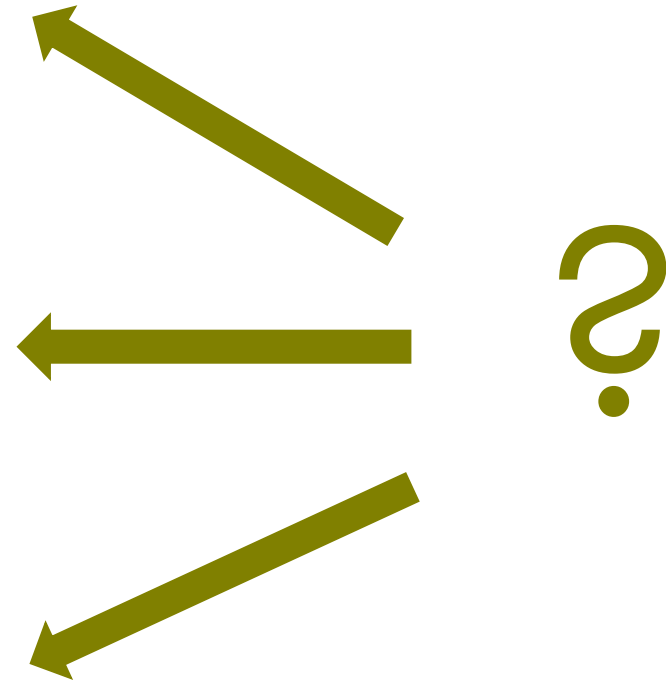


Complex carnivore enclosures



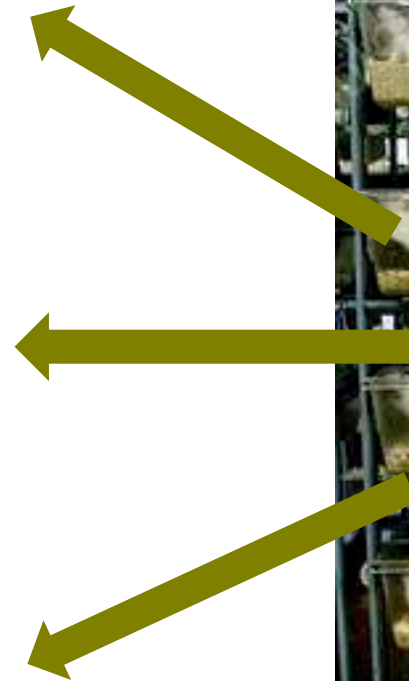


Where does the food come from ?



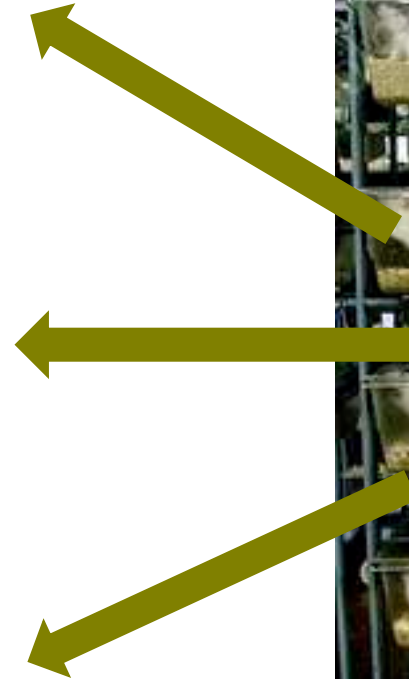


Not so complex food animal enclosures





Animals are primarily animals ... and secondarily food





Animals are primarily animals ... and secondarily food





If this is not good prey animal husbandry ...





If this is not good prey animal husbandry ...



... then this isn't, either:





If this is not good prey animal husbandry ...



... then this isn't, either:





If this is a better way to raise prey animals ...





If this is a better way to raise prey animals ...



... then this is as well:





23

Issues Surrounding Surplus Animals in Zoos

MADS FROST BERTELSEN

“Surplus animal” has a negative connotation, and it seems appropriate to start a discussion around this topic with a definition. Surplus animals are surplus to the needs of the population and in excess of the needs of the individual institution. In other words, a surplus is more likely to occur the better a species is doing in zoos. The more offspring that are born and the better the individuals are doing in terms of coping with disease, stress, and other problems, the more likely it is that the supply will exceed the demand. Fundamentally surplus animals are a sign of success. The day when zoos breed a surplus of all endangered animals would be a day to celebrate. However, surplus animals eat, take up space (which is ultimately always limited), and evoke the emotions of staff and visitors, so their management is a complicated issue.

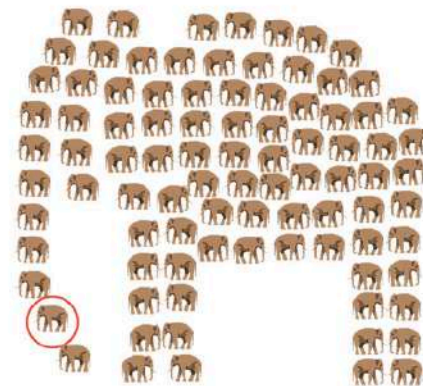
Sustainable Populations

It is a declared goal of zoos to be self-sufficient with regard to animals, and indeed the ambition is to maintain genetically, demographically, and physically healthy populations over the long term to promote visitor education and to act as an assurance population for potential future reintroduction to the wild.^{1,2} This can happen only through careful genetic management of the animals in the zoo's care and through continued breeding to provide a constant turnover of the population.²⁻⁵ For many veterinarians trained to cater to the survival of the individual animal and used to contributing to species conservation one case at a time, it sometimes takes an effort to step back and see the bigger picture, where it is the long-term health and survival of the *population* that counts (Fig. 23.1). The population has become the patient, and that patient is not doing very well. Despite efforts to maintain sustainable captive populations, recent scrutiny has demonstrated that zoos are far from that goal—far enough to warrant the use of the term “sustainability crisis” (see Chapter 22).⁶ To increase sustainability, a change in the culture surrounding zoo animal breeding is needed. Successful breeding of a species must become more important to an institution than maintaining specific individuals. Relocation of individuals must happen more often to allow

mate choice, increase genetic diversity, and address infertility (see Chapter 21). That is, a reproductive management plan must be implemented for each individual to optimize the possibility of retaining genetic diversity through breeding while maintaining manageable yet sustainable populations.

Meeting the Demand

Contraception or even just separation of the sexes are powerful tools to reduce the number of offspring. However, the safety and reversibility in terms of future breeding are often (depending on the species) less than optimal.^{6,7} More importantly though, sustainability is not just about numbers but about breeding the right animals. Although sometimes skewed,⁸ the average sex ratio at birth is close to 1:1, producing an unavoidable surplus of males in species where one male breeds with several females (e.g., a “harem”



• **Figure 23.1** For veterinarians trained to cater to the survival of the individual animal and used to contributing to species conservation one case at a time, it sometimes takes an effort to take a step back and see the bigger picture, where it is the long-term health and survival of the population that counts.

system of breeding). This applies to most hoofstock and megavertebrates as well as a number of carnivores. Contraception cannot solve this problem, and surplus males are an unavoidable byproduct of breeding enough females.

Even if the exact production of offspring could be controlled, which of course it cannot, the demand is impossible to predict. Disease, senescence, and infertility may change the influx required to sustain a population. Therefore a certain surplus is necessary, as it provides an essential buffer for unexpected events. However, such surplus animals cannot be sustained forever. Although some bachelor herds are necessary for backup and for providing a “genetic pool” from which to draw new breeding males, permanently housing animals surplus to the breeding programs ultimately will obstruct the system by taking up space and resources that could otherwise be used for more genetically valuable breeding individuals. There are only so many seats on the bus, so to speak.

Breeding Is “Natural”

In general, zoos strive to provide “natural” conditions for their animals, although in practice numerous compromises are made; “natural” space is not available to most animals, “natural” diets are often substituted, and “natural” habitats and climates are mostly lacking. On the upside, “natural” parasites, “natural” predator stress, and “natural” competition for food are usually absent. Most would agree that “natural” behavior should be strived for, and with food provided and no predators to avoid, breeding becomes a paramount tool in providing “natural” behavior and “enrichment” in the shape of courtship, pair bonding, mating, pregnancy, nursing, feeding, mother–infant bonding, playing, sparring, and so on.⁹⁻¹¹ All these effects are essential parts of animal welfare, but in excess of population needs, surplus animals are the unavoidable secondary outcome.

How to Deal With Surplus Animals

So for the reasons previously mentioned, a certain surplus of animals is not only a sign of healthy populations but also an unavoidable “by-product” of sustainable breeding. As previously mentioned, simply housing surplus animals indefinitely is counterproductive to achieving sustainable populations, as these animals take up space that could be used for individuals more genetically valuable to the population. Sending such animals to private holders or institutions outside of the breeding programs raises a multitude of ethical issues and ultimately is not a long-term solution. Reintroduction into the wild unfortunately is rarely a realistic solution. Thus the only option available is to kill (or cull) those animals definitely in surplus.

It can be (and has been) argued that killing any animal is ethically wrong; however, the vast majority of human beings and every zoo known to the author have made the fundamental choice that it is acceptable to kill animals. For example, approximately 95% of the US population consume



• **Figure 23.2** What animal species may be culled to feed others? Most people have an irrational cutoff on the “cuteness index” shown here. Where is yours? Note that generic meat (*) falls very low on the scale.

meat,¹² and every zoo utilizes invertebrates, rodents, chickens, and ungulates as feed for its carnivorous inhabitants. In addition, most zoos kill invertebrates, rodents, and various other animals categorized as pest species. An old anecdote accounts for a conversation between a gentleman and a distinguished lady at a fundraising dinner. The gentleman offers the lady \$100,000 if she will agree to sleep with him, an offer to which she assents. He then asks if she would do it for \$10. The lady gets upset and says: “What kind of woman do you think that I am?” to which he replies: “We have already established that. Now we are just haggling over the price.” The situation is very analogous to our relationship to killing animals; consciously or not, we all apply a more or less arbitrary cutoff on a scale from cockroach to great ape (Fig. 23.2), and our position on the scale is highly dependent on our nationality and cultural background.^{10,13}

When the rational decision to cull has been made, the next question is when to do so. Some institutions have instituted a practice of culling infants deemed surplus shortly after birth; however, this precludes them from harvesting several of the benefits of producing surplus animals: the enormous behavioral enrichment to the parents of raising the offspring and the idea of having a buffer. A compromise, based on the three peaks of mortality observed in the wild, appears rational and “natural”: In “nature” the mortality is highest in infants, animals around dispersal age, and in animals past their prime; geriatrics are not common in the wild. Zoos can mimic this by reducing litter sizes perinatally, primarily culling around dispersal age, and by minimizing the amount of postreproductive animals to a minimum deemed necessary for balanced group composition. Maintaining postreproductive individuals of solitary or monogamous species is counterproductive for population sustainability.

How the animals are used following culling has a great impact on the acceptance of the practice by zoo employees and the public alike. Also here, there are vast cultural differences around the globe, yet it appears that a utilitarian



The 'surplus problem'

Surplus = 'too much' --- animals that can't be placed



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Killing surplus
(breed & cull, management
euthanasia)
= *"not using all
management options"*



The 'surplus problem'

Surplus = 'too much'

--- animals that can't be placed

Killing surplus
(breed & cull, management
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§

Animal legislation

*to protect animals
from unengaged
management*

and exploitation



The 'surplus problem'

Surplus = 'too much'

--- animals that can't be placed

Killing surplus
(breed & cull, management
euthanasia)
= "*not using all
management options*"

'breed & feed' sounds like
an excuse

§

Animal legislation

*to protect animals
from unengaged
management*

and exploitation



But all this is 'breed & feed' ...





*It's not about 'surplus animals' –
it's about producing animal food
in a respectful way
that reflects the zoo world's
high husbandry and welfare
standards.*



It's not about 'surplus animals' –

*it's about producing animal food
in a respectful way
that reflects the zoo world's
high husbandry and welfare
standards.*

**- and no animal has better welfare
than an animal in your zoo**



Closing your eyes is no longer an option



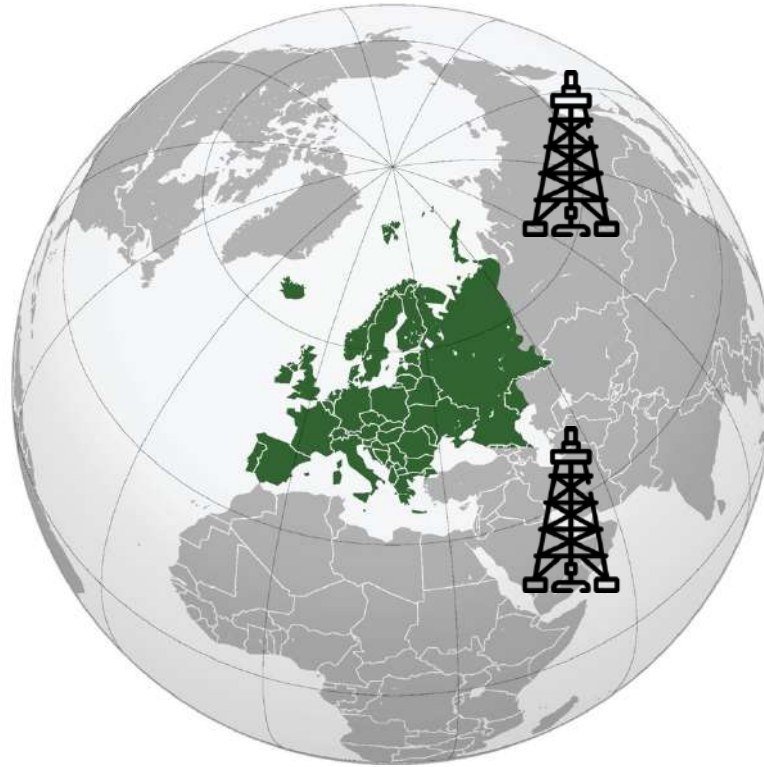


Closing your eyes is no longer an option



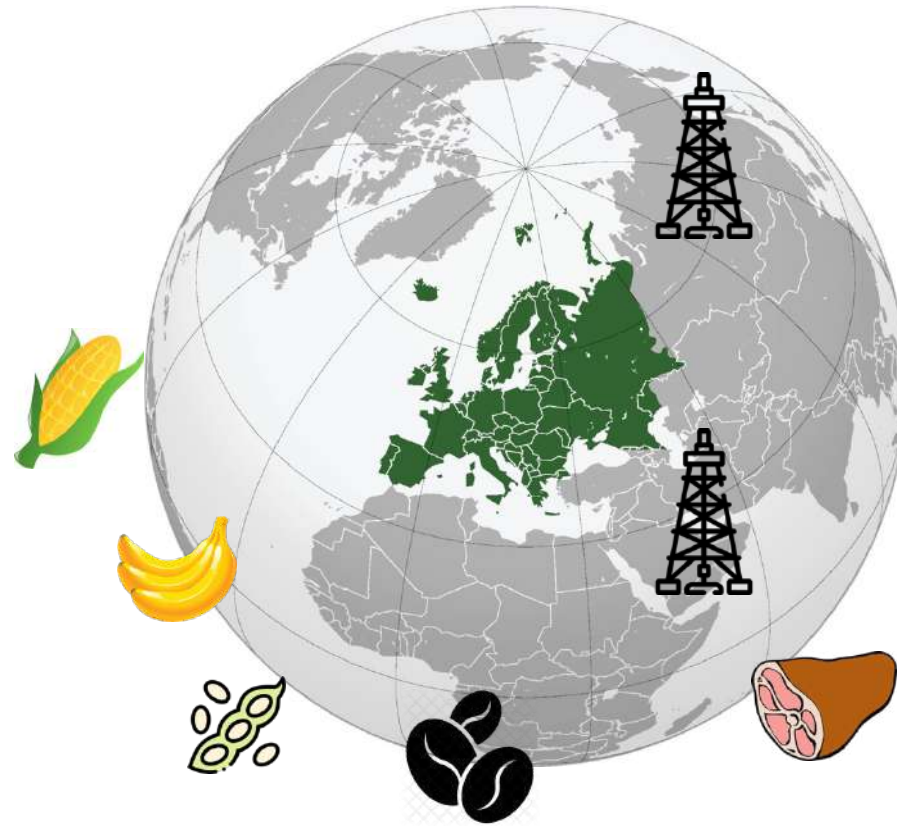


Closing your eyes is no longer an option



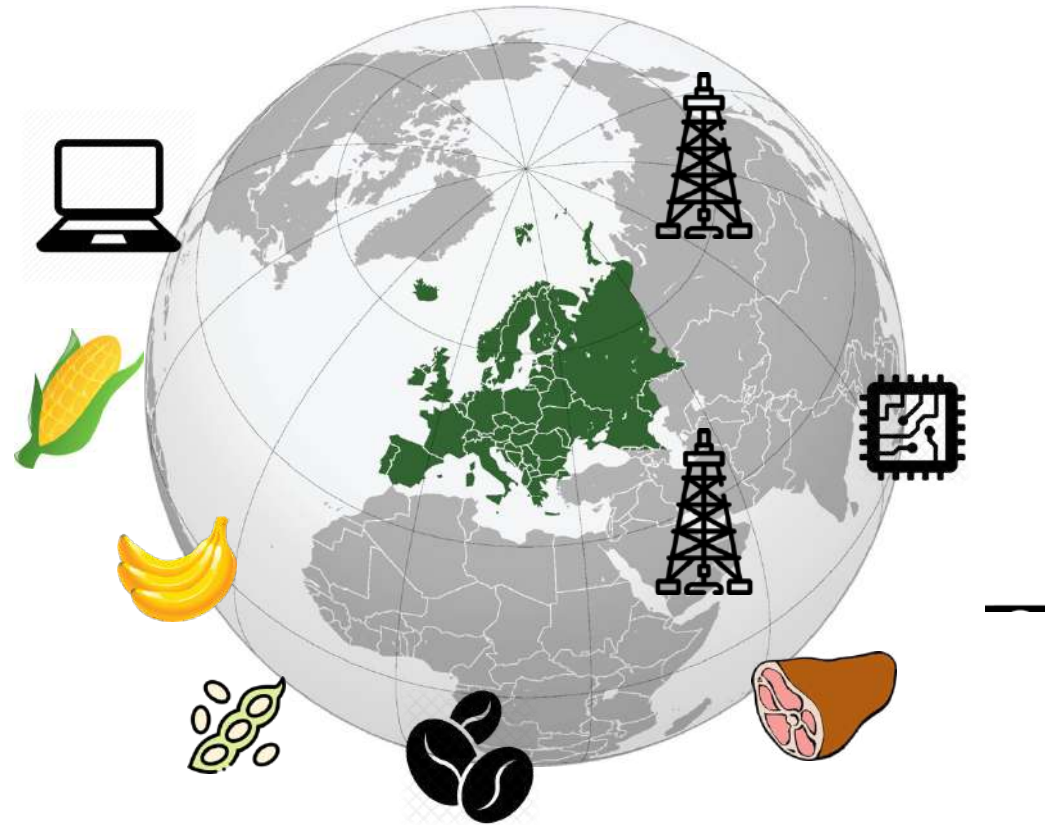


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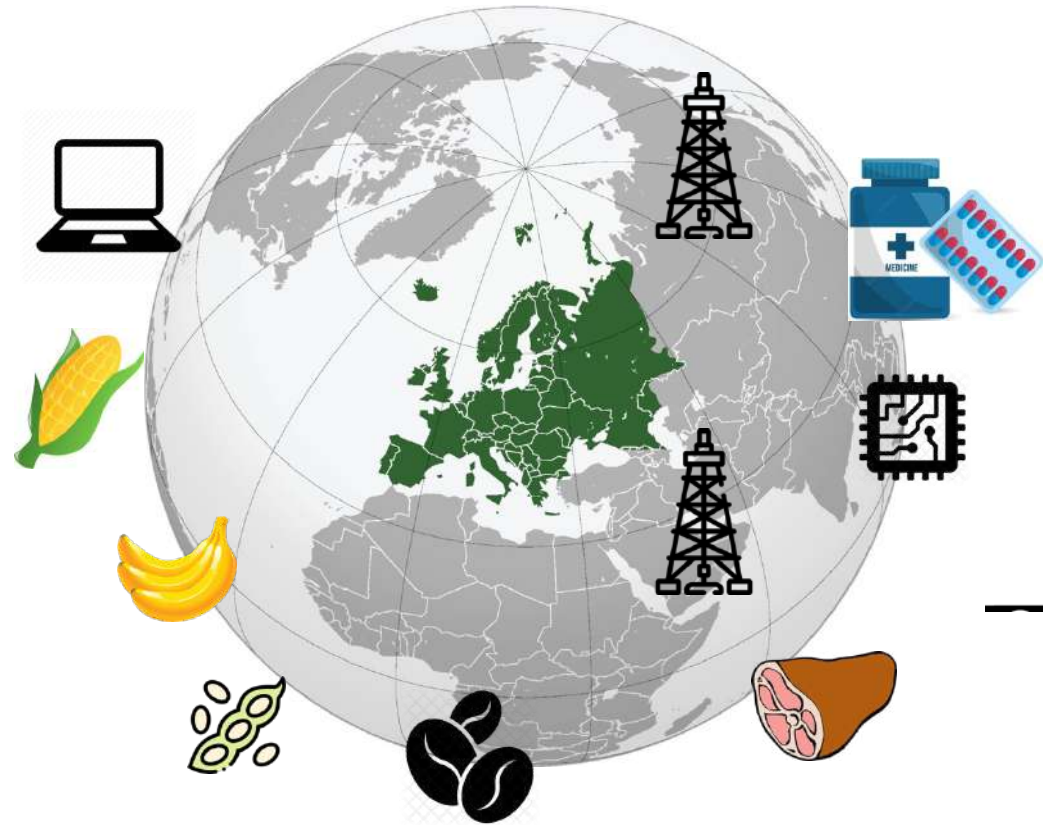


Closing your eyes is no longer an option





Closing your eyes is no longer an option





Closing your eyes is no longer an option





Closing your eyes is no longer an option



... especially not if
you want to
promote
conservation



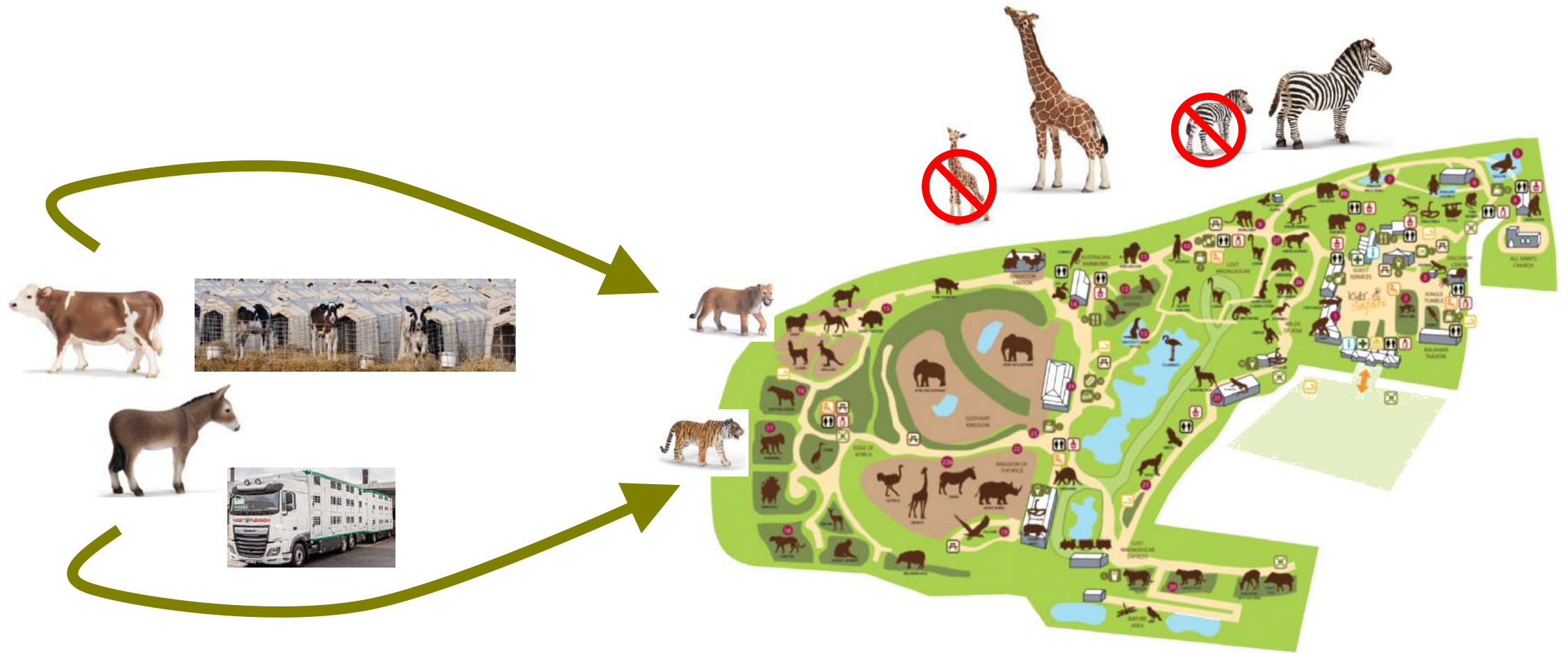
Didactic mission: not to close your eyes







Didactic mission: not to close your eyes





Didactic mission: not to close your eyes





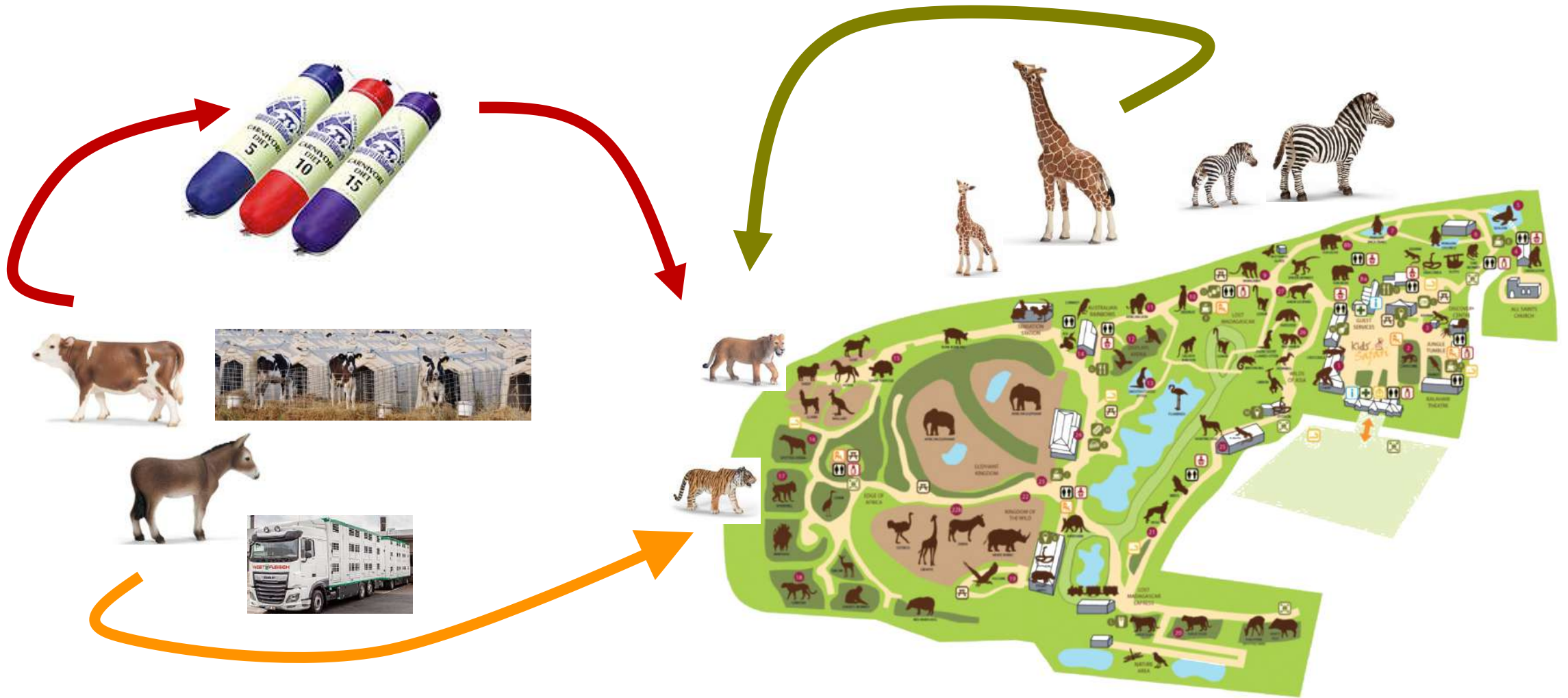


Didactic mission: not to close your eyes





What is the lower carbon footprint ?





Feeding zoo animals to zoo animals



Feeding zoo animals to zoo animals

... is about welfare-oriented animal food production



Feeding zoo animals to zoo animals

- ... is about welfare-oriented animal food production*
- ... granting animals the welfare benefits of reproduction,
including offspring raising
appropriate social structures*



Feeding zoo animals to zoo animals

- ... is about welfare-oriented animal food production*
- ... granting animals the welfare benefits of reproduction,
including offspring raising
appropriate social structures*
- ... is particularly sustainable*



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- ... is about welfare-oriented animal food production*
- ... granting animals the welfare benefits of reproduction,
including offspring raising
appropriate social structures*
- ... is particularly sustainable*
- ... facilitates a safer studbook management*



Feeding zoo animals to zoo animals

- ... is about welfare-oriented animal food production
- ... granting animals the welfare benefits of reproduction,
 - including offspring raising
 - appropriate social structures
- ... is particularly sustainable
- ... facilitates a safer studbook management
- ... and is educative for all these reasons
 - including understanding biology-based conservation



How can we support in situ conservation ...





*How can we support in situ conservation ...
... with the narrative that management killing is unacceptable ?*







Zoo Basel musste zwei seiner Publikumslieblinge schlachten

BASEL. Zwei Shetland-Ponys, im Alter von 38 und 31 Jahren, wurden geschlachtet und in den «zoointernen Nahrungskreislauf» eingespiesen.

Der Zoo Basel trauert um zwei Stars seines Kinderzollis. Die beiden Shetland-Ponys Wilma und Ohitako waren «Lieblinge von Generationen von Kinderzolli-Kindern», heisst es in einer Mitteilung. Am 30. August seien die beiden im Alter von 38 und 31 Jahren geschlachtet worden. «In den letzten Wochen haben sie zunehmend an Gewicht und Muskelmasse verloren», so der Zoo weiter. «Der körperliche Zerfall liess sich trotz Betreuung durch das Tierärzteteam, energiereichem Spezialfutter und regelmässigen Zahnkorrekturen nicht aufhalten», begründet der Zoo den Entscheid. Sie wurden in den «zoointernen Nahrungskreislauf» eingespiesen – sie wurden an die Raubtiere im Zoo verfüttert, für die solche «Ganzkörperverfütterungen» förderlich seien.



Die Shetland-Ponys Wilma (schwarz-weiss) und Ohitako (braun). ZOO BASEL/T. WEBER

Der Zoo betont, dass er sich in erster Linie am Wohlergehen der Tiere orientiere. Leider bedeute das manchmal auch, den Tod künstlich herbeizuführen – etwa wenn die Lebensqualität eines Tieres nicht mehr gewährleistet werden könne. «So sieht es die Natur vor. Sie ist nicht roman-

tisch. Sie tötet, wenn es nicht passt», heisst es. Im Zoo sei damit nicht nur die Aufzucht von Jungtieren und das Leben verschiedener Arten zu sehen, sondern man decke auch einen Teil des Fleischbedarfs der Fleischfresser und schliesse damit den Nahrungskreislauf. STEVE LAST



«Sie wurden 38 und 31 Jahre alt»: Zoo-Tierarzt Christian Wenker zeigt, was von den beiden Shetlandponys übrig geblieben ist. Foto: Kostas Maros

Warum Tiere töten im Zolli zum Alltag gehört

Ponys geschlachtet Was passiert in der Zolli-Metzgerei?

Blick in ein Gebäude des Basler Zoos, der Besuchenden verwehrt bleibt.



2021|01

manatimagazin

Magazin des Tiergartens der Stadt Nürnberg und des Vereins der Tiergartenfreunde Nürnberg e.V.



Schwerpunktthema Populationsmanagement

Töten, um zu retten?!

Invasive Arten bedrohen die Natur. Zu deren Schutz wird es sogar notwendig zu töten.

Delphine brauchen sichere Orte

Nimmt die Bedrohung der Delphine in den Ozeanen zu, bleiben noch Delphinarien.

Der Fall Wolf

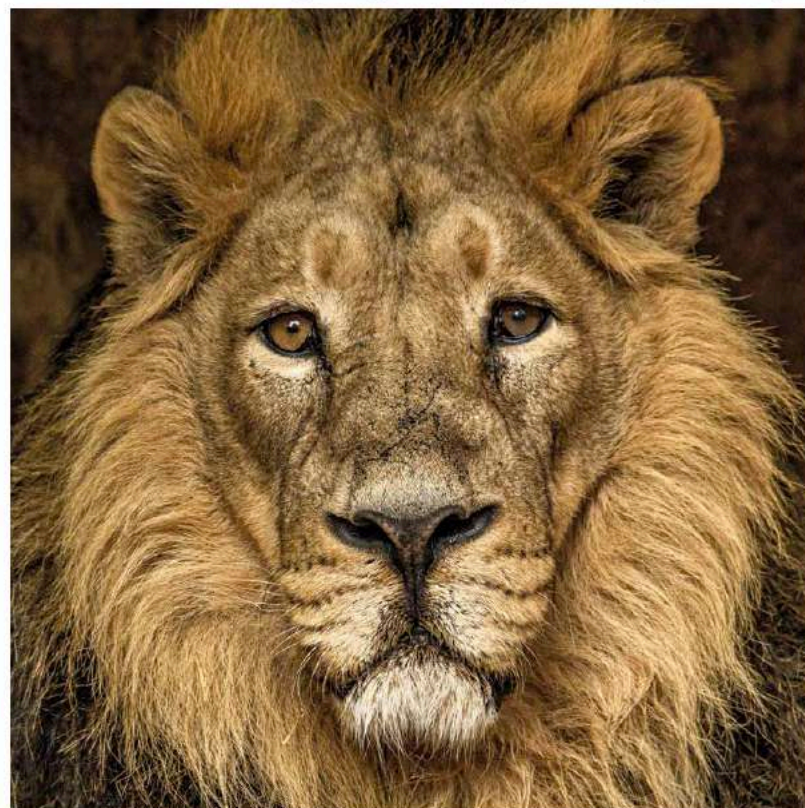
Interview: Modernes Populationsmanagement aus Sicht von Prof. Sven Herzog.



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TIERABGÄNGE: Todesfälle / Futtertiere

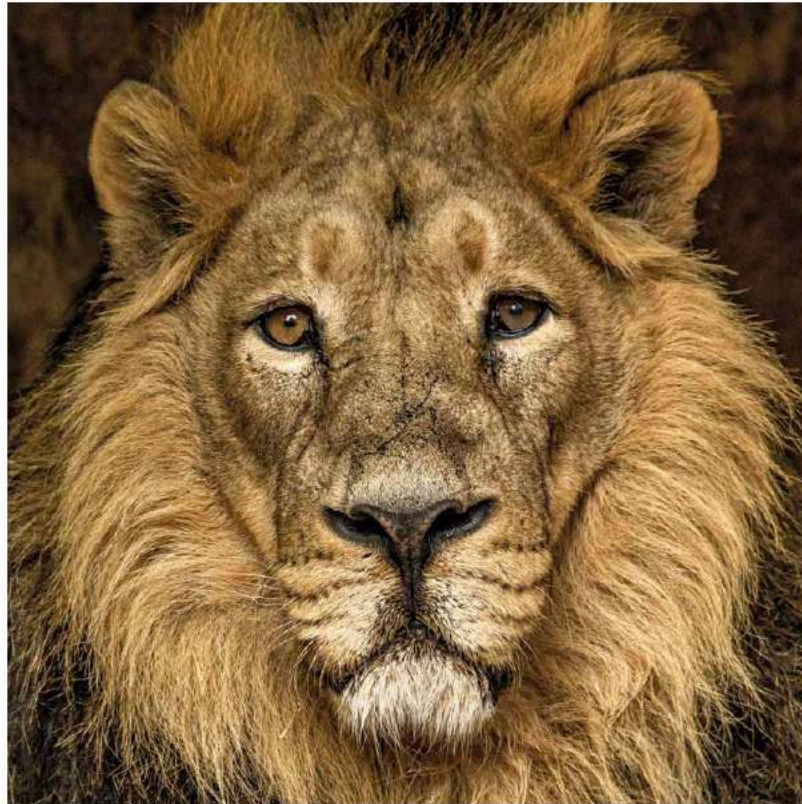
Oktober	November	Dezember	Januar	Februar	März
7,0 Meerschweinchen (Tierfutter)	1,0 Fischotter	1 Sandratte (Juv.)	1,0 Totenkopfpaffe	1,2 Meerschweinchen (Tierfutter)	1 Blütenfledermaus
1,4 Zwergkaninchen (Tierfutter)	1,0 Zwergzebu (Tierfutter)	2,9 Meerschweinchen (Tierfutter)	5,0 Meerschweinchen (Tierfutter)	1 Streifenwiesel (Juv.)	1,0 Rüsselspringer
1,0 Grevyzebra (Tierfutter)	0,1 Rotschnabeltoko	1,1 M Inipigs (Tierfutter)	0,1 Kaliforn. Seelöwe	1,0 Prinz-Alfred-Hirsch (Tierfutter)	9 Degus (Juv.)
1,0 Schabrackentapir	0,1 Rotohrbülbül	1,0 Wisent (Tierfutter)	0,1 Pinselohrschwein	1,0 Hirschziegenantilope (Juv.)	0,1 Steppenmurmeltier
1,2 Elenantilopen (Tierfutter)	1 Vellchenorganist (Juv.)	0,1 Kaffernbüffel (Tierfutter)	1 Zwergziege (Tierfutter)	0,1 Mähnspringer (Juv.)	1,0 Ziesel (Tierfutter)
1,0 Weißer Löffler	1 Senegalamarant (Juv.)	2,0 Hirschziegenantilopen (1,0 Juv.)	4 Zwergziegen (Juv.)	0,1 Humboldtpinguin	1 Streifenwiesel (Juv.)
1,0 Türkistangare	1,0 Alpenkrähe	1,0 Mähnspringer (Tierfutter)	1 Mähnspringer (Juv.)	1,0 Amazonasente	0,1 Kalifornischer Seelöwe
1 Helmkopfgecko	0,1 Atlasagame	1,0 Waldrapp	1,0 Chileflamingo	1 Türkistangare	1,0 Kulan
2 Atlasagamen	1 Anolis	1,0 Marmelente	1,2 Amazonasenten (Tierfutter)	1 Senegalamarant	0,1 Przewalskipferd
1 Farberfrosch	1 Rotfeuerfisch	1,2 Amazonasenten (Tierfutter)	1,0 Wüstengimpel	1,0 Pantherchamäleon	0,3 Wapitis (Tierfutter)
0,1 Kärpflingscichlide	1 Wabenschilderwels	1 Senegalamarant (Juv.)	1 Senegalamarant (Juv.)	0,1 Regenbogenfisch	0,2 Rentiere (Tierfutter)
		1,0 Dornwaldgecko	1,0 Rotohrbülbül		1,0 Rotducker (Juv.)
		1,0 Helmkopfgecko	1 Europ. Sumpfschildkröte		0,1 Kamerunschaf
		1 Oman-Dornschwanzagame	1 Gecko		0,1 Steinhuhn
		1 Hardun-Agame	0,1 Bartagame		0,1 Vellchenorganist
		1 Hundskopfschlinger	0,1 Tanganjika-Killifisch		0,1 Wüstengimpel
		0,1 Tanganjika-Killifisch	1 Pfauenaugenbarsch		2 Schmetterlingsfinken
			2 Perlmutterbarsche		2 Senegalamaranten
			1 Wandelnde Gelge		3 Hardun-Agamen
			1 Rote Mangrovekrabbe		1 Rotfeuerfisch



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TIERABGÄNGE: Todesfälle / Futtertiere

Oktober	November	Dezember	Januar	Februar	März
7,0 Meerschweinchen (Tierfutter)	1,0 Fischotter	1 Sandratte (Juv.)	1,0 Totenkopfpaffe	1,2 Meerschweinchen (Tierfutter)	1 Blütenfledermaus
1,4 Zwergkaninchen (Tierfutter)	1,0 Zwergzebu (Tierfutter)	2,9 Meerschweinchen (Tierfutter)	5,0 Meerschweinchen (Tierfutter)	1 Streifenwiesel (Juv.)	1,0 Rüsselspringer
1,0 Grevyzebra (Tierfutter)	0,1 Rotschnabeltoko	1,1 M Inipigs (Tierfutter)	0,1 Kaliforn. Seelöwe	1,0 Prinz-Alfred-Hirsch (Tierfutter)	1 Degus (Juv.)
1,0 Schabrackentapir	0,1 Rotohrbülbül	1,0 Wisent (Tierfutter)	0,1 Pinselohrschwein	1,0 Hirschziegenantilope (Juv.)	0,1 Steppenmurmeltier
1,2 Elenantilopen (Tierfutter)	1 Veilchenorganist (Juv.)	0,1 Kaffernbüffel (Tierfutter)	1 Zwergziege (Tierfutter)	0,1 Mähnenpringer (Juv.)	1,0 Ziesel (Tierfutter)
1,0 Weißer Löffler	1 Senegalamarant (Juv.)	2,0 Hirschziegenantilopen (1,0 Juv.)	4 Zwergziegen (Juv.)	0,1 Humboldtpinguin	1 Streifenwiesel (Juv.)
1,0 Türkistangare	1,0 Alpenkrähe	1,0 Mähnenpringer (Tierfutter)	1 Mähnenpringer (Juv.)	1,0 Amazonasente	0,1 Kalifornischer Seelöwe
1 Helmkopfgecko	0,1 Atlasagame	1,0 Waldrapp	1,0 Chileflamingo	1 Türkistangare	1,0 Kulan
2 Atlasagamen	1 Anolis	1,0 Marmelente	1,2 Amazonasenten (Tierfutter)	1 Senegalamarant	0,1 Przewalskipferd
1 Farberfrosch	1 Rotfeuerfisch	1,2 Amazonasenten (Tierfutter)	1 Wüstengimpel	1,0 Pantherchamäleon	0,3 Wapitis (Tierfutter)
0,1 Kärpflingscichlide	1 Wabenschilderwels	1 Senegalamarant (Juv.)	1 Senegalamarant (Juv.)	0,1 Regenbogenfisch	0,2 Rentiere (Tierfutter)
		1,0 Dornwaldgecko	1,0 Rotohrbülbül		1,0 Rotducker (Juv.)
		1,0 Helmkopfgecko	1 Europ. Sumpfschildkröte		0,1 Kamerunschaf
		1 Oman-Dornschwanzagame	1 Gecko		0,1 Steinhuhn
		1 Hardun-Agame	0,1 Bartagame		0,1 Veilchenorganist
		1 Hundskopfschlinger	0,1 Tanganjika-Killifisch		0,1 Wüstengimpel
		0,1 Tanganjika-Killifisch	1 Pfauenaugenbarsch		2 Schmetterlingsfinken
			2 Perlmutterbarsche		2 Senegalamaranten
			1 Wandelnde Gelbe		3 Hardun-Agamen
			1 Rote Mangrovekrabbe		1 Rotfeuerfisch



Veränderungen im Tierbestand

1 Türkis-Tangare 1 Hundskopfschlinger 137 Ba
7 Degus 2 Mähnenspringer (Tierfutter) 1 Mähne
1 Rotkopfschaf (Tierfutter) 2 Zitronengrundeln 1
1 Java-Schwimmfrosch 1 Sandratte 1 Steppen
1 Seepferdchen 2 Riesenkaninchen (Tierfutter)



Meaningful lives in an anxiety-free environment



Reproducing animal groups with intact social structures
Feeding of (respectfully killed) zoo-raised animals



Thank you for your attention