**ANNEX A - Open questions on Foxes**

Biological Hazards, Animal Health and Welfare (BIOHAW) Unit

Annex A- open questions on the biology, farm practices, genetics, breeding and reproduction of **foxes**

This request is relevant to the welfare of foxes:

* Red fox (*Vulpes vulpes* and also known as ‘grey fox’)
* Arctic fox (*Vulpes lagopus*, previously classified as *Alopex lagopus* and also known as ‘blue fox’);

Including their hybrids kept for fur production. The call for evidence encompasses all categories of animals involved in fur production, including breeding animals, juveniles, and those (growing animals) being raised specifically for pelting.

This Annex encompasses all categories of animals involved in fur production, including breeding animals, juveniles, and those (growing animals) being raised specifically for pelting purposes. It is important to note that killing for pelting falls outside the scope of this mandate.

*Please compile Table 1 by inserting your reply in the appropriate text box. In case you would have any additional information/documents/data, you are welcome to submit them in Portalino following the instruction provided.*

# Table 1 – oPEN QUESTIONS ON Foxes

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| --- | --- |
| **BIOLOGY OF FOXES** | |
|  | **Domestication evidence**: Please provide any evidence of domestication in the species of interest. Evidence should be provided by appropriate reference to literature, technical study and/or data (e.g. indicators of a preceding domestication process whereby the current domestic population differs from the wild ancestors or relatives as shown in the morphological, physiological or behavioural traits). Highlight any relevant differences between Red fox and Arctic fox (if applicable).  *Domestication is defined in this question as the genetic process, whereby animals change phenotypically and genetically as a response to living under human supervision. Animal domestication can lead to diverse behavioural, physiological, and neurocognitive changes in domesticated species compared to their wild relatives.* |
| *Answer:* |
|  | **Behaviour and biology in the wild:** Please provide references related to the behaviours and other biology of current domestic genotypes of Red fox and Arctic fox, respectively. |
| *Answer:* |
|  | **Group size:** Please provide evidence by references for advantage/disadvantage of housing foxes individually and/or in groups, across the different life stages. |
| *Answer:* |
|  | **Physical characteristics of farmed foxes:** Please provide evidence on the average morphological measures of farmed foxes (male and females) across different production and physiological phases. |
| *Answer:* |
|  | **Predatory and exploratory behaviours/traits:** Please provide evidence on the morphological, sensory, and behavioural adaptations for predation and exploratory attitudes in these species, and how these traits may differ between wild and farmed genotypes. |
| *Answer:* |
|  | **Physiological indicators of stress:** Is there any evidence of physiological stress indicators in both wild and farmed fox? Please provide any evidence in the form of scientific or grey literature. |
| *Answer:* |
|  | **Burrowing/digging behaviours in foxes:** Please provide observational studies, behavioural analyses, and other relevant Animal-Based Measures (ABMs) that document burrowing and/or digging behaviours in both Red and Artic foxes. This evidence encompasses the frequency, purpose, and environmental factors influencing such behaviours, as well as the implications of these behaviours for welfare in captive settings. |
| *Answer:* |
|  | **Winter dormancy:** Please report evidence whether these species exhibit dormancy behaviours as reported from their natural habitats when under farmed conditions. Insights into how farming practices accommodate or alter these natural cycles, and the effects of such practices on animal welfare, are of particular interest. |
| *Answer:* |
|  | **FARM PRACTICES - FOXES** |
|  | **Purpose and frequency of handling**: For which purpose is handling and restraint performed (e.g. vaccination, breeding, cage transfer) and what is the frequency of handling and restraint of foxes for each of the purposes?  *Handling is defined in this question as the process of how people physically interact with animals in their care (e.g. moving or manipulating the animals).*  *Restraint is defined in this question as the application to an animal of any procedure designed to restrict its movements. This restraint is typically achieved by manual, mechanical or chemical means to limit some or all of an animal's normal voluntary movement during, e.g., examination, collection of samples, drug administration, therapy, or manipulation.* |
| *Answer:* |
|  | **Handling and restraint for routine practices:** How is handling and restraint done for routine practices? Is any equipment used for the handling and restraint (e.g., tongs and snout clips)? Can you provide its specifications? What is the frequency of use of such tools?  *The same definition of handling and restraint in question F9 applies here.* |
| *Answer:* |
|  | Are there available **guidelines/good practices** that are applied in different countries? Does handling require any optional or mandatory training?  *The same definition of handling and restraint in question F9 applies here.* |
| *Answer:* |
|  | **Fear of humans**: What practices are followed on farms to decrease the fear of humans in chinchillas (in addition to any genetic selection)? Practices might include positive reinforcement strategies to foster positive experiences with humans, for example, through regular, gentle interaction and/or provision of environmental enrichment. |
| *Answer:* |
|  | **Handling**: Please provide evidence, demonstrated by animal-based measures or other measures of potential welfare consequences (e.g. injuries, behaviours, vocalization) or affective states (e.g. potential source of stress, fear and pain) associated with handling.  *The same definition of handling and restraint in question F9 applies here.* |
| *Answer:* |
|  | Please provide information on **nutritional content and diet composition of feed** for fur-farmed foxes according to the different ages and physiological states. |
| *Answer:* |
|  | Please provide information on **feeding practices** (type of feed, administration etc…).  *Type of feed: e.g. pellets, wet food, formulated for species and age, supplemented with fresh water.*  *Administration: e.g. Once daily feeding, rationed with adjustments based on age, health status, and physiological state.* |
| *Answer:* |
|  | Is there any **routine medical treatment associated to common diseases** (e.g. parasite, diarrhoea etc)? Treatments may include but are not limited to vaccination practices and prophylactic agents. |
| *Answer:* |
|  | **Surgical procedures:** Are any routine surgical procedures carried out in animals and why? |
| *Answer:* |
|  | **Animal identification**: How are individual foxes identified? |
| *Answer:* |
|  | Due to the different species, are the same **farming practices** followed for red foxes also used for the arctic fox and hybrids and *vice versa* or are there differences? (e.g. differences in group composition, housing conditions, feeding routine and nutritional composition) |
| *Answer:* |
| **GENETIC SELECTION, BREEDING AND REPRODUCTION OF FOXES** | |
|  | **Genetic selection:** Please provide an overview of the specific traits prioritized in the breeding of foxes for fur production, including but not limited to temperament, physical characteristics (body size, etc.), and any other relevant traits (e.g. litter size, litter size at weaning). Additionally, we seek information on the objectives behind these breeding choices, the weight associated to each trait, the breeding value, and the typical generation interval observed. |
| *Answer:* |
|  | **Fearfulness**: We are interested in learning about the advancements in genetic selection for reduced fearfulness towards humans within farmed populations. Please include methodologies employed for assessment and any documented outcomes. |
| *Answer:* |
|  | **Indirect effect of selection for desirable traits:** Please report on any unintended consequences (positive or negative) arising from the selection of specific traits (e.g., the selection for a specific fur colour, inbreeding), supported by relevant literature. |
| *Answer:* |
|  | **Fox hybrids:** To what extent are hybrid foxes present in fur production? Please provide insights into their prevalence and any relevant data or studies on which fox hybrids are kept for fur production and for which purpose. Information on any traits or qualities that these hybrids are selected for, and any difference from Red and Arctic species would be appreciated. |
| *Answer:* |
|  | **Breeding season:** What is the season when breeding is carried out for each species of foxes? And on average how long is the oestrous cycle and gestion period for each? |
| *Answer:* |
|  | Is there evidence of **aggressive behaviours** among cubs and how they can be prevented or mitigated? |
| *Answer:* |
|  | **Mating and reproduction:** What type of reproduction methods are used (artificial or natural)? If both methods can be used, please estimate the % of methods used. |
| *Answer:* |
|  | **Mating and reproduction:** When natural mating is used how long is the male kept with the female? |
| *Answer:* |
|  | **Mating and reproduction:** Are any practices used to facilitate reproduction? Examples can be nutritional practices (e.g. slimming of females, flushing), use of hormones, light cycle, etc. Please describe how these practices are applied. |
| *Answer:* |
|  | **Artificial insemination:** How is oestrus detection performed and how often? |
| *Answer:* |
|  | **Artificial insemination:** If artificial insemination is used, how it is performed in the vixens? |
| *Answer:* |
|  | **Artificial insemination:** How is semen collection carried out in males used for artificial insemination? |
| *Answer:* |
|  | **Reproductive performance:** How is reproductive performance measured? Please provide any evidence in relation to benchmarks for mating success, litter size, cubs mortality, weaning weight, etc. |
| *Answer:* |
|  | **Parenting:** Is parenting done by vixens or by both parents? Please elucidate whether parental care is typically provided by single mothers or by both parents within each species, including the duration of the pair (if applicable). |
| *Answer:* |
|  | **Weaning:** How is weaning carried out? What is the weaning age (please provide common practice and also ranges)? What practices are followed during weaning? |
| *Answer:* |
|  | **Breeders:** Information on the length of time breeding foxes are farmed within the production cycle, specifying if they partake in multiple breeding cycles and any factors influencing this decision. |
| *Answer:* |
|  | **Cub fostering:** Please provide information on whether cub fostering is a practice utilized within the industry, especially in scenarios of excessive offspring or maternal neglect, and outline how these situations are managed. |
| *Answer:* |
|  | **Mortality:** Could you estimate neonatal mortality, the timing, and reasons for that? |
| *Answer:* |