Animal Ethnology

Chapter I: General Introduction to Animal Ethnology

Humans require proteins in their diet, which can originate from both plants and animals. Animal-based proteins are provided by meats (red and white), milk, and eggs. The FAO (Food and Agriculture Organization), founded in 1943, recommends an animal protein intake of 30 grams per capita per day. Indeed, this quantity is estimated at 7.8 grams/capita/day in Algeria, 77 grams in New Zealand, 66 grams in the USA, and 52 grams in France.

Increasing the availability of animal proteins strictly requires:

- Improving animal production.
- The genetic improvement of animals.

To achieve these objectives, it is essential to understand domestic animals, as well as the zootechnical methods required to raise, maintain, and multiply them. This ensures the improvement of animal production to maximize benefits in the exploitation of domestic animals (while simultaneously preserving their welfare).

1.Domestic Animals and Domestication

1.1.Definitions

Domestic animals are those that humans have tamed, keep living with them, and which can reproduce and perpetuate under their control. Humans utilize their products (milk, eggs, feathers, wool, etc.) during their lifetime, and after their death, capitalize on their by-products (meat, fat, skin, horns, hair, etc.).

Domestication (from the Latin *domus*, "house," and *domesticus*, "belonging to the house") is the action humans have exerted on wild animals by appropriating them and utilizing them for pleasure or to satisfy their needs. Effectively, domestication is the loss,

acquisition, or development of new traits resulting from prolonged interaction, control, and even selection by human beings. Domesticated animals have thus been morphologically, physiologically, and psychologically transformed compared to the primitive wild forms from which they originated.

In Algeria, the domestic species acclimatized for centuries are: the horse (along with the donkey), cattle, sheep, goat, dromedary, dog, cat, rabbit, and various poultry birds.

1.2.History of Domestication

For millennia, Hominids were content to exploit natural resources—both animal and plant—through predation. To feed themselves, they tracked the cycles of these populations. During the Neolithic period, humans became sedentary, which altered their relationship with wild populations. It was only with the depletion of resources around their habitats, along with the increasing distances and time required for gathering, that the cultivation and domestication of animal species became advantageous. Agriculture and animal husbandry thus became more profitable than hunting, gathering, and fishing.

Consequently, humans captured small groups of wild animals, removed them from their natural way of life, and subjected them to new, artificial conditions of growth and reproduction. From then on, these selected and exploited animal subpopulations, along with their descendant lineages, led a separate existence distinct from that of their wild counterparts. These new living conditions contributed to the elimination of certain genetic, morphological, and behavioral traits, and the selection of others—whether these traits were pre-existing or resulted from mutations that occurred during the domestication process.

Human management initially allowed more vulnerable animals, which would have died in the wild, to survive. Subsequently, humans culled overly aggressive animals; furthermore, fearful individuals that refused to feed or reproduce in captivity left no descendants. Thus, gradually, humans selected a population of animals whose sensitivity, nervousness, and vigor had been diminished compared to the wild species. This process of developing new genetic diversity has continued over time, tracking the development of technologies and markets.

The transition from hunter-gatherer to farmer-herder provided humans with the capacity to control and increase food resources. Domestication is therefore of paramount importance in human history, as the animal has participated in the construction of human civilizations.

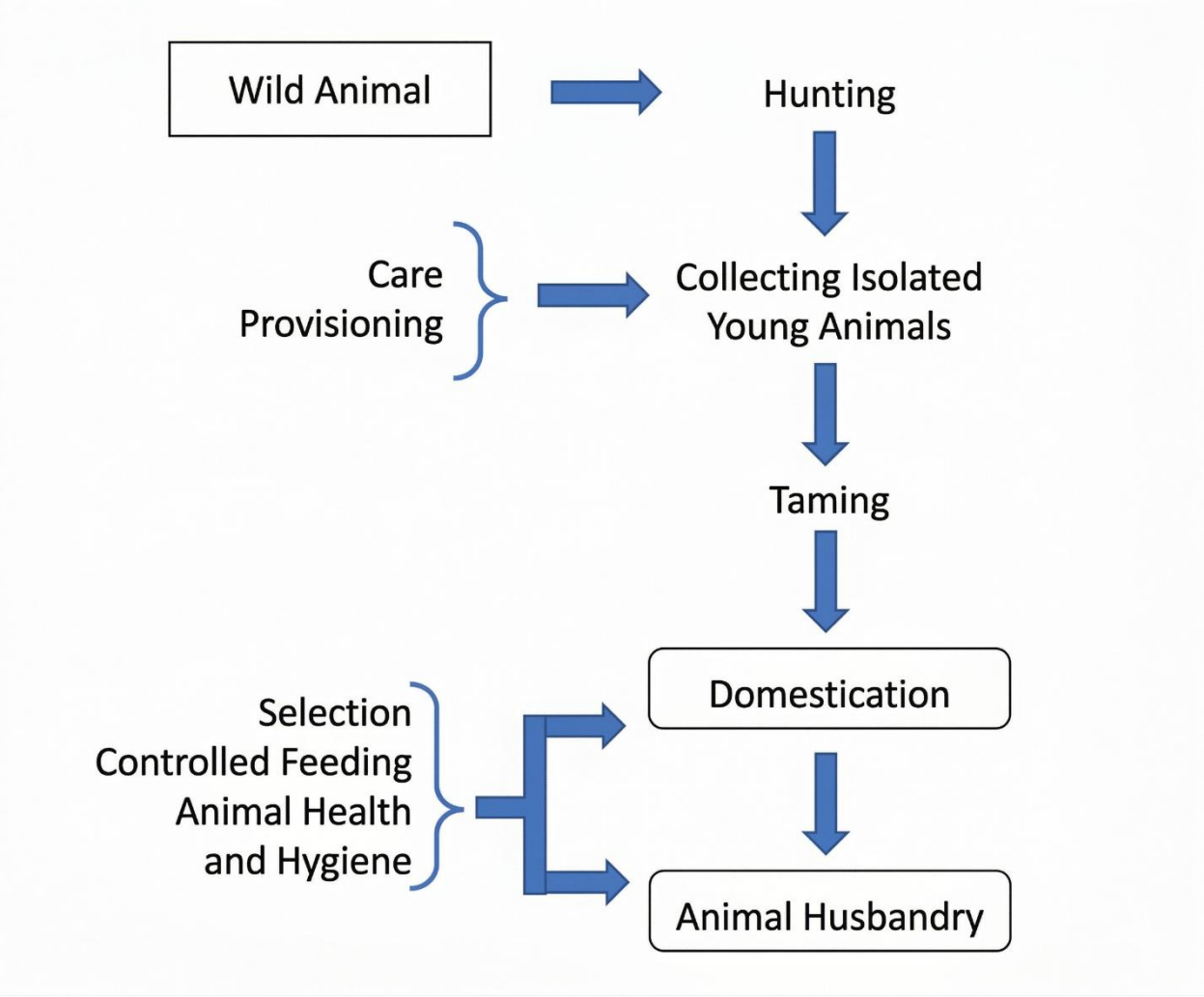

Figure 1: Schematic of the Domestication Process (Vaissaire, 2014)

1.3.Conditions of Domestication

The conditions for the domestication of an animal are:

- Possessing the instinct of sociability;
- The ability to be tamed;
- Maintaining fertility in captivity;
- The transmission of acquired traits to offspring.

Eras of domestication for main species (approximate dates):

- Dog $\approx$ 12,000 years BC (Before Christ).
- Goat, sheep, pig: $\pm$ 8000 BC.
- Turkey: 5000 BC.
- Horse, donkey: 4500 to 3000 BC.
- Rabbit: Middle Ages (Spain).

II.Zoological Classification of Animals

2.1.Definitions

- **Zoology:** is the science that studies animals.
- **Taxonomy:** is the science of the laws of classification.
- **Systematics:** is the discipline that assigns a precise place to a given living element within a classification system composed of nested criteria. These criteria are, in decreasing order of magnitude: Kingdom, Phylum, Class, Order, Family, Genus,

and Species. The living world is therefore expressed through a series of levels, the last two of which—Genus and Species—serve to designate it universally.

Example: For a zoologist, speaking of a bovine implies referring to a living being belonging to the Animal kingdom, the Vertebrate phylum, the Mammalian class, the Paraxonian or Artiodactyl Ungulate order, the Bovidae family, the *Bos* genus, and the *taurus* species.

Binomial nomenclature is attributed to Carl Linnaeus (1707-1778), a Swedish naturalist who first laid the foundations for the classification of plants and animals based on their morphological types (Kingdom, Phylum, Class, Order, Family, Genus, Species).

Table 1: Zoological classification of main domestic animals

Phylum	**Class**	**Order**	**Sub-order**	**Family**	**Species**	**Domestic Animal**
Vertebrates	**Mammals** (Ungulates)	Perissodactyla	Hippomorpha	Equidae	*Equus caballus*	Horse
					Asinus asinus	Donkey
		Artiodact	Ruminants	Bovida	*Bos taurus*	Cattle

		yla		e		
					Ovis aries	Sheep
					Capra hircus	Goat
				Camelidae	*Camelus dromedarius*	Dromedary
	Mammals (Carnivores)	Fissipeds	Caniformia/Feliformia	Canidae	*Canis familiaris*	Dog
				Felidae	*Felis catus*	Cat
	Mammals (Glires)	Lagomorphs		Leporidae	*Oryctolagus cuniculus*	Rabbit

	Mammals (Suiformes)			Suidae	*Sus scrofa domesticus*	Pig
	Birds (Carinatae)	Galliformes	Phasiani	Phasianidae	*Gallus gallus*	Chicken
				Meleagrididae	*Meleagris gallopavo*	Turkey
		Anseriformes	Anseri	Anatidae	*Anas platyrhynchos*	Duck
		Columbiformes		Columbidae	*Columba livia*	Pigeon
	Birds (Ratites)	Struthioniformes	Struthiones	Struthionidae	*Struthio camelus*	Ostrich

2.2.Concept of Species

A species is a group of individuals that are similar in their morphological and physiological characteristics, their habitat, and their behavior, and are fertile among

themselves. The criteria for belonging to the same species are:

- Interfertility;
- Morphology;
- Chromosomal set.

III.Animal Ethnology and Ethnic Classifications

3.1.Ethnology

3.1.1. Concept of Ethnology Ethnology derives from the Greek words (*ethnos* "people" and *logos* "science or reason"). It is the science that studies all the characteristics of each ethnic group or people (in domestic animals, we speak of breeds).

3.1.2. Concept of Breed A breed is a subdivision of a species. This word is used to designate a group of individuals resembling one another, but distinct from other individuals of the same species. These individuals possess the property of conserving their distinctive traits, which they transmit to their offspring. This denomination of "breed" applies primarily to domestic animals, meaning those raised under the special influence of humans; it is not used for wild animals.

EXAMPLE:

- **Species:** *Ovis aries* (domestic sheep).
- **Breed 1:** Merino sheep (of Spanish origin).
- **Breed 2:** Ouled Djellal sheep (of Algerian origin).

A breed designates a group of animals belonging to the same species that possess a certain number of common characteristics and have the ability to transmit these traits collectively to their descendants. The detailed description of the typical external characteristics of the breed (size, coat color, head shape, etc.) is provided by a standard listed in the breed's genealogical book.

Different types of breeds can be distinguished:

- The unstandardized breed or "traditional population", present in a given region and a candidate to have its existence officialized. This situation is still common in developing countries (e.g., Algeria).

- The standardized breed (a concept originating in England in the 18th century). Under this type, we also find:

    - Breeds with large populations;

    - Breeds with small populations or endangered breeds.

    - International breeds that exist in several regions of the world (e.g., the "Holstein" cattle breed).

    - Local breeds defined as breeds predominantly linked, by their origin and breeding method, to a specific territory.

It happens that a large number of domestic animals do not belong exclusively to any particular breed due to the diversity of crossbreeding, whether occurring by chance or deliberately arranged by humans.

3.1.3. Formation and Evolution of Breeds

- **a) Influence of Nature:** The particularities of conformation, skin appendages, or aptitudes characterizing a breed are the consequence of a modification that occurred gradually under the influence of natural and external factors, following long persistence (natural selection). Among these influences, we particularly highlight climate, habitat, and the type of diet.

- **b) Action of Humans:** Depending on the desired goal, the breeder selects specific

individuals from animals of the same species to mate them. Selection favors the reproduction of animals that possess superior attributes in order to propagate their qualities (genes) to the greatest number. Breeds of domestic animals thus become the work of humans.

Practiced empirically since domestication, it was not until the 18th century with Robert Bakewell that the shift toward modern selection was initiated. The rediscovery of Mendel's laws of heredity, coupled with Darwin's theory of evolution, the development of biometrics, and the successful integration of genetics and statistics in the early 20th century, paved the way for the modern selection of domestic animals. Often, one no longer knows nor finds in nature the breeds modified and conquered by human hands. The division into natural and artificial breeds is not possible.

Brilliant results obtained by breeders in creating improved breeds can be presented as examples:

- The "Holstein" cattle breed, with cows remarkable for their abundant milk yield;
- English cattle breeds, highly suitable for fattening;
- The "Merino" sheep for its wool production;
- The "Saanen" goat breed for its excellent dairy aptitude.

3.1.4. Naming of Breeds Breed names derive from various circumstances, such as:

- The primitive cradle or native country of the breed (e.g., "Normande" cattle breed, "Ouled-Djellal" sheep breed, "Leicester" sheep breed, "Cashmere" goat breed);
- Characteristic peculiarities of conformation, appendages, or aptitudes (e.g., "Shorthorn" cattle breed, "Hamra" sheep breed, "Kabyle Dwarf" goat breed);
- The influence of breeders who modified the animals (e.g., Bakewell's breed).

Some Technical Expressions Used:

- **Purebred (Race pure):** One whose formation does not originate from two different breeds. The original animals descend, without admixture, from a known breed, and moreover, they were born, or at least conceived, in the homeland of the mother breed.

- **Crossbreeding (Croisement):** Mating of animals of different origins and breeds; their offspring is called a crossbreed (*métis*). In a more restricted sense, this term *métis* applies to the fruit of mating an inferior female breed with a more noble breeding male.

- **Retrogradation (Reversion/Atavism):** This is the condition of a subject which, wholly or partially, does not resemble its immediate ancestors (father and mother), but rather takes after its distant ancestors. This term is primarily applied in an unfavorable sense to indicate the return of flaws inherent to the ancestors, from which more recent generations were exempt.

3.2.Principles of Ethnic Classification

Several possibilities for classifying breeds are available. The most utilized is Baron's classification. Baron classifies ethnic coordinates into:

a) Static coordinates (plastic or morphological): Animals are classified:

- According to their silhouette into: Rectilinear, Concavilinear, or Convexilinear profiles.

- According to their bodily proportions into models: Longilineal, Mediolineal, or Brevilineal.

- According to their format into: Eumetric, Ellipometric, or Hypermetric.

b) Phaneroptic coordinates: Phaneres or skin appendages are all the horny productions of the skin (hair, hooves, horns, feathers). It is a secondary element, the decoration of the form. For example: long or short hair, curly or flat (straight) hair, coat color (unicolored, bicolored, tricolored, or piebald when white is present), mucous membranes (light, dark, or spotted), horn type, etc.

c) Energetic coordinates: In relation to aptitudes or production type. For cattle, breeds are generally classified into 4 categories:

1. Specialized dairy breeds;
2. Improved beef (meat) breeds;
3. Dual-purpose breeds (meat and milk);
4. Unimproved breeds, which are most often rustic breeds (mountain breeds or breeds belonging to poor environments).

As for sheep and goats, breeds are classified into:

1. Dairy breeds;
2. Meat breeds;
3. Wool breeds;
4. Dual-purpose breeds.

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