How should the concept of animal welfare be perceived in the case of the domestic rabbit farming (*Oryctolagus cuniculus*)

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Abstract. The paper addresses two types of rabbit breeding considered by the authors to be in line with the ethological welfare requirements of the domestic rabbit (*Oryctolagus cuniculus*). The two farming variants we propose are: the classic system, criticized by many, but which ensures the minimum comfort to all individuals, and the free range system, or in landscaped spaces which effectively simulate the natural habitat. This last option obliges the farmer to provide the rabbits with a minimum of conditions. Otherwise, comfort will benefit only a small part of the rabbit herd, and the economic damages can be significant.
Key Words: *Oryctolagus cuniculus*, animal welfare, rabbitry, free range, socialization.

Introduction. Rabbit is one of the most versatile livestock species, responding successfully to bio-economic principles, which promote a clever use of resources and their conversion into added value products, such as functional foods (Petrescu & Petrescu-Mag 2018; Petrescu-Mag et al 2012).

The problem of raising rabbits under welfare conditions is very trendy. Often, in addition to the physical breeding space, nutritional comfort and food quality, emphasis is placed on breeding animals in large groups, where animals have the opportunity to socialize, which is correct to a certain degree: free animals are generally happy animals.

Let us not forget, however, that when animals interact, the conflict between socialization and territoriality arises (Petrescu-Mag et al 2014). On the one hand, animals can mate freely and establish various relationships with the group, but on the other hand, they compete with each other for potential mates, for food, for space, for underground shelter areas and for farrowing places. All this ends with injuries, dead animals, infections, mutual castration in the case of males, lost kits, lost litter, destroyed nests, cannibalism on the basis of trauma or fear in females, oppression and, in case of agglomeration or humidity, transfer of parasites.

We must understand that the wild version of life is not always the happiest variant for the animal, but it is the only natural variant of life. Therefore, to consider that the free range system means welfare for all farm animals, without meeting certain criteria such as maximum population density, is totally wrong.

Welfare variants proposed for farm animals with territorial behavior, such as rabbits

The first variant is the classic one, with the breeding of animals in separate compartments, in spaces not too large, but with decent volume and surface, in which the animals only socialize occasionally, but it provides each animal with sufficient and diversified food, its own territory, shelter, farrowing place in the form of cage in the case of does and dry surfaces with reduced risk of propagating parasites from one individual to another. This will prevent injuries and mutual castration in case of males, avoid killing newborns by does preparing to give birth, avoid cannibalism caused by fear and other traumas. In fact, this is the classic version, which has been used since ancient times. Even if this variant is criticized by animal welfare followers, it is a variant that ensures the minimum comfort for all individuals (Table 1). We do not have to think from a human perspective, by estimating if we would like to live in those conditions, but to take into account the biology and preferences of the species before defining the term of welfare (Cervera et al 2017; Farkas et al 2018). For each species, well-being means something else. The limited space deprives the welfare of a nomadic species, while an animal that lives 80% of its life underground, in small spaces, is unhappy when it is under the open sky and has no shelter to hide.

Table 1

Overview of the dimensions of the most common housing systems used in Europe for rearing of young females or lactating does with litter (Szendrő et al 2019)

	Width (cm)	*Length (cm)*	*Height (cm)*	*Total available surface (cm^2)*
Young or non-pregnant female	38	45-50	35	1,710-1,900
Lactating doe: basic standard models	38	87-102[a,b]	32-35	3,300-3,900
Lactating doe: wider versions	46	95-102[b]	35	4,370-4,700
Lactating doe: enriched cages with wire-mesh platform (width 20 cm)	38-46	95-102[b]	60-65	4,370-5,600[c]
Lactating doe: enriched cages with plastic-mesh platform	46-52.5	102[b]	65-80	5,600-6,400[c]
Pen/Park systems (4 does) with plastic-mesh platform (width 25 cm)	180-200	95-102[b]	Open top	Total: 21,600-25,400[c] Per doe: 5,400-6,350[c]

[a]Oldest models might be 75 cm in length; [b]the nest area is included; [c]the platform surface is included.

The second variant is the option of growing in large groups, on larger areas, where animals can fully socialize (Figure 1), but the population density, which must be less than 1 individual per 10 m^2, must be taken into account to avoid conflicts between individuals, the mutual destruction of nests and the spread of parasitism and infections (Andrist et al 2012, 2013, 2014). Otherwise, the damage will be high for both the breeder and the rabbit herd, and the welfare of the animals will be limited to a small number of animals, namely the dominant ones and those of middle age (Hemsworth et al 2013).

Figure 1. Transylvanian giant rabbit farmed in free range system eleven years ago (photo: original).

In the case of shelters especially designed and protected from moisture or faecal deposits, the population density may be increased, provided that the breeding females are separated.

In the case of females in lactation, the population density can be increased up to 1.6 m^2 per adult female. But other conditions are also required such as: perforated plastic grid floor to avoid the accumulation of faecal material with parasites; for space saving, the shelter can be organized on three levels, including the floor and two more levels, without a roof; manually operated doors can be implemented, so that 4-8 rabbits can socialize during periods when the aggressiveness is lower (but in no case when they occupy their nest and the first days after birth); space for hay and green twigs for

crunching. This variant provides for the female to stay with its own litter for up to 35 days.

After weaning, the youth must be moved to special places for fattening, where they will stay from 35 days up to a maximum of 70-80 days, the duration of the fattening depending on the breed. In a space that provides at least 1500 cm^2 per rabbit, a herd 30-40 individuals will grow. The floor must be of perforated plastic or perforated wood to ensure the faeces and urine drop. Platforms raised on 25-50% of the total area of the living space with the height of 21-25 cm are required for the rabbits to hide under them, or tubes with an inner diameter of about 50 cm can be used as hiding places. Also, there must be a space for hay and green twigs for crunching.

Conclusions. It is very topical to address the problem of rabbit farming under welfare conditions. Often, in addition to the physical space, nutritional comfort and food quality, emphasis is placed on raising rabbits in large groups, where animals have the opportunity to socialize, which is correct to a certain degree: free animals are generally happy animals. Let us not forget, however, that when animals interact, the conflict between socialization and territoriality arises. The two farming variants we propose are: the classic one, criticized by many, but which ensures the minimum comfort to all individuals, and the free range variant, or rabbit farming in landscaped spaces that effectively simulate the natural habitat. This last option obliges the farmer to provide the rabbits with a minimum of conditions. Otherwise, comfort will benefit only a small part of the rabbit herd, and the economic damages can be considerable.

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