

Evaluating perception of animal welfare among owners of family farming units on dry tropical lands

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ABSTRACT

Objective: To evaluate the perception of animal welfare (AW) among owners of family farming units (FFUs) through selected livestock management practices.

Design/ Methodology/ Approach: A semi-structured questionnaire was applied to survey a sample of 80 FFU owners. The survey collected data on demographics, AW perception, feeding practices, infrastructure, animal handling and use of preventive veterinary care.

Results: Among respondents, 92.5% were male and 7.5% female. 51.2% were over 60 years old, 36.2% were between 40 and 59 years old. Around 80% had 20 to 40 years of livestock-rearing experience. Educational attainment was low; 80% had no schooling, only 20% had an average of 4.3 ± 5 years of schooling. In terms of species, 47.5% raised small ruminants (sheep and goats) and 52.5% managed cattle; in a complementary way all raised other species (such as pigs, poultry, or equines) within mixed production systems. Notably, 98.8% of respondents were unaware of AW principles; none had received technical assistance or training related to AW. Feeding practices primarily relied on grazing native pastures, with 20% providing feed supplements (1-4 kg) during the dry season. Water sources included the river (53%) and deep wells (47%). Only 37.5% had basic infrastructure for animal handling, while 62.5% has none. A 33% of respondents practiced preventive veterinary care, whereas 67% only provided veterinary care to animals when symptoms of sickness appeared.

Limitations/Implications of the study: Traditional production systems in place pose a significant barrier to the implementation of effective AW measures.

Findings/Conclusions: There is not AW perception in the FFUs evaluated. A critical need for outreach, education, and training programs is emphasized, in order to equip FFU owners with knowledge and tools to implement animal welfare standards.

Keywords: Cattle, animal handling, resources, feed.



INTRODUCTION

Animal welfare (AW) is an aspect of great importance, which increases worldwide and has generated concern in the sectors dedicated to animal husbandry or production. Animal welfare brings about major changes in the way animals are kept and treated in farms, slaughterhouses, and other production systems (Broom, 2016). Animal welfare is currently considered a priority in the scientific field, in response to some of the concerns related to livestock production (FAO, 2008; Rosas *et al.*, 2019).

The success of any livestock production system depends fundamentally on the personnel in charge of handling the animals, who are responsible for their welfare and productivity (Losada-Espinosa, 2020). Because of this, the World Organisation for Animal Health (2023) designated animal welfare as “*the physical and mental state of an animal in relation to the conditions in which it lives and dies*”. WOAHA (2023) also stated that it is a complex and multidimensional issue addressed from scientific, ethical, economic, cultural, social and political aspects. Moreover, Valadez *et al.* (2018) indicated that the factors that influence animal welfare also have an impact on human health; Hence the concept of One-Health, that promotes a comprehensive and collaborative approach, recognizes the link between human, animal and environmental health.

In the dry tropics lands of the state of Guerrero, there are many families that are dedicated to livestock activity with semi-extensive systems, where there are no studies that show the knowledge that producers have about animal welfare. Despite livestock farming is an activity that owners have developed for a long time. For this reason, the objective of the study was to evaluate the perception that the owners of family farming units have about animal welfare through the management practices they implement under tropical conditions, in the state of Guerrero, Mexico.

MATERIALS AND METHODS

Description of the study area

The study was established during the dry season (January-May) in the towns Morelita and Tiringeo, of the municipality Tlapehuala (Guerrero), Mexico. Both towns are located within the geographical coordinates 18° 14' 14" N and 100° 32' 22" W, at 240 m altitude. Climate is classified as warm sub-humid (AW₀), with an average temperature 35 to 45 °C, and 750 mm of average rainfall per year.

Population and sample size

In the study communities, 100 owners of family farming units (FFUs) were identified, the equation described by Rojas (2013) was applied to obtain the sample size:

$$n = \frac{N \times Z_a^2 \times p \times q}{d^2 \times (N - 1) + Z_a^2 \times p \times q}$$

In a population size of 100 owners, with 95% confidence level and 5% margin of error; sample size n=80 FFU owners.

Data collection and statistical analysis

A semi-structured questionnaire was applied personally to the producers. The survey structure was segmented into demographic data (gender, age, level of schooling, years dedicated to livestock activities), knowledge about animal welfare (AW), animal feeding, infrastructure in the production units, livestock management, application of preventive veterinary medicine. Questions in the survey were open, we sought to generate conversation with the interviewees. Data collected were analyzed using descriptive statistics, it is included here their graphic analyses in figures.

RESULTS AND DISCUSSION

Data showed that 92.5% of FFU owners belong to the male gender and 7.5% to the female gender. About 51.25% are over 60 years old, 36.25% between 40 and 59 years old; more than 80% of the respondents said that have been engaged in livestock farming for about 20 to 40 years. However, most of the producers do not have any degree of schooling; only 20% reported that had an average 4.3 ± 5.0 years of schooling, a percentage represented by the youngest producers in the study.

The age of the producers and educational attainment are considered fundamental factors that limit training and the adoption of cutting-edge technologies in the production units (Fuentes *et al.*, 2012; Salas *et al.*, 2013). For example, Villanueva *et al.* (2022) reported that producers in Puebla, with a higher level of education, do a better management in their production units by implementing better management systems.

Another finding; of the total number of production units, 38 breed small ruminants (goats and sheep) and other 42 breed cattle. In most of the production units, owners breed other species (pigs, poultry, equines or canines). A notable 98.8% is unaware of the aspects of animal welfare (AW) and only 1.2% have any idea about welfare in animal handling.

It is remarkable that none of the producers have received advice or training regarding animal welfare; however, 80% have unconsciously applied some intuitive principles of animal welfare that they consider important. Such as better feeding practices, water supply, and general care of their animals. The lack of training and scarcity of economic resources are a set of aspects that limit proper development of the family farming units (Juárez *et al.*, 2014).

Of the producers surveyed, 85% consider this issue of animal welfare as important, also showing interest in receiving training (Figure 1).

Animal feeding

The main source of feed in all production units is through grazing on native pastures or maize (*Zea mays*) harvest residues. Only 15% add feed supplements to the diet of their animals in the dry season every year, offering 1 to 4 kg of supplement per animal. Those owners indicated they do this due to the low availability in quantity and nutritional quality of the forage offered (Figure 2).

Juárez *et al.* (2014) reported that 98% of producers implement a traditional grazing system in their production units in a micro-watershed of the Michapa river, where animal

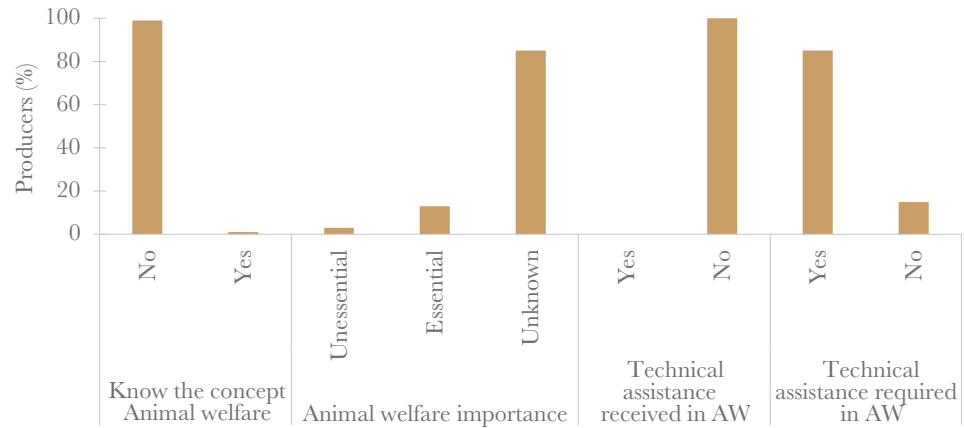


Figure 1. Perception about animal welfare (AW) among the owners of family farming units in the localities Morelita and Tiringueo, municipality of Tlapehuala (Guerrero), Mexico.

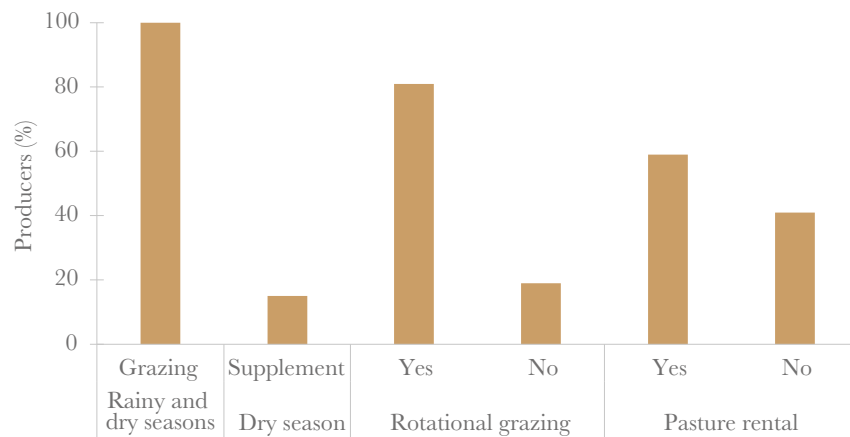


Figure 2. Animal feeding used at family farming units (FFUs) in the localities Morelita and Tiringueo, Tlapehuala (Guerrero) Mexico.

feed is mainly based on grazing and only 1% offered balanced feed. Therefore, it is considered that the use of supplementation is added according to the availability of existing forages in a region (Vilaboa and Díaz, 2009).

About 59% of producers also have reported that they need to rent grazing areas, to store forages or by-products, or they need to plant species for cutting fodder (Sheen and Riesco, 2002). Seasonal variations and irregular rainfall affect forage production in pastures, which consequently affect animal productivity and animal welfare in production systems (Gallo & Tadich, 2018).

The main source of water used for the animals is the river. About 53% of the owners made journeys of 1.5 to 3 km to get water during the dry season; they had water available for a short time, only once a day; while the other 47% transported water to grazing areas, or used a deep well. During the rainy season there are more water sources available, such as streams, dams, embankments, or water channels. Thus, the animals have more water available at a short distance, even in the same grazing areas.

Animal handling

About 62.5% of the producers do not have a corral for animal handling, only 37.5% have a rustic corral for cattle management. Producers said they don't have the financial resources to build more sophisticated facilities (Figure 3).

Due to the grazing system used in the production units, the animals remain most of the time in grazing areas. This allows them to use some areas for resting, such as the natural shade provided by trees (Damián *et al.*, 2022). Ceballos and Tarazona (2023) indicated that facilities are of great importance for animal handling, because infrastructure facilitates handling, reduce the time for activities, provide better animal welfare conditions, and decrease the risk of accidents or injuries to both animals and the personnel responsible of animal handling.

Animal health

Only 33% of familiar farming units implement vaccination programs on a regular basis to prevent diseases. That activity is accomplished through local veterinary services. The other 67% do not use veterinary medicine programs on their animals, they only attend to their animals when an illness occurs. Owners stated that they consider it less expensive to care for a single animal. This shows the lack of knowledge available to producers. In addition, the average age of producers is a limiting factor to generate changes in this type of production units. The results obtained by Vilaboa and Diaz (2009) showed the opposite, indicating that 88% of producers evaluated in Veracruz implemented preventive health campaigns, such as vaccination and deworming.

About 58% of the producers do control ectoparasites, mainly according to the presence of flies (*Haematobia irritans*). During the last three years, the death of 43 bovines, 33 goats and 27 sheep has been recorded due to different causes. It is very likely that producers need training to implement prevention measures. This is key since owners only seek advice from a veterinarian when an animal is already sick, and they do not observe healing after several days.

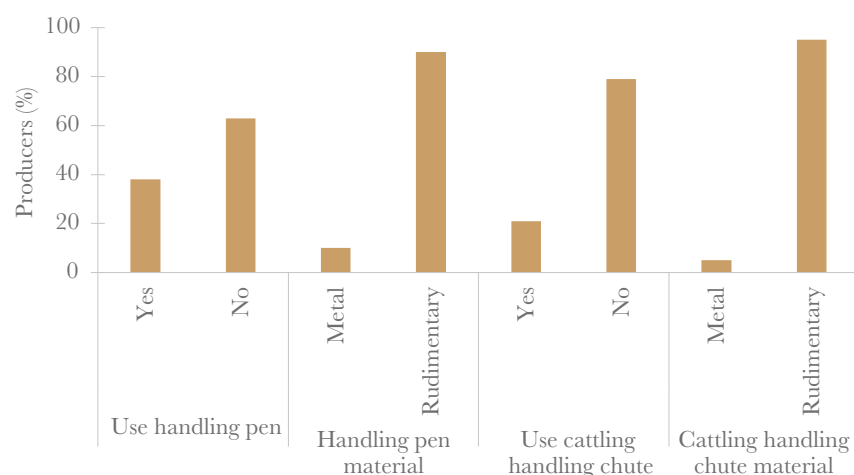


Figure 3. Facilities for livestock management implemented by producers in the localities Morelita and Tiringueo, Tlapahuala (Guerrero), Mexico.

CONCLUSIONS

In the family farming units evaluated there is no perception of animal welfare. Therefore, management practices that are developed lack elements that provide welfare. We consider it is necessary to provide training to support the implementation of elements for animal welfare, towards a better development of the family farming units.

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