

# Personal features and management activities related to cattle welfare

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## ABSTRACT

**Objective:** To describe the personal features, as well as the management activities related to cattle welfare in Loma Bonita, Oaxaca, Mexico.

**Design/Methodology/Approach:** This is a cross-sectional, descriptive, and quantitative study. The sampling was non-probabilistic for convenience. Between December 2019 and March 2020, a questionnaire was applied to 27 farmers.

**Results:** The average age of the ranchers is 44.6 years; 55.6% have more than 20 years of experience; 25.9% herd their cattle using a stick; 48.1% do not disinfect the udders; and 25.1% do not wash their hands during milking.

**Study Limitations/Implications:** The results and conclusions are limited to the sample used in the present study. Therefore, extending them to all livestock farmers in the municipality would require a broader study that considers statistical techniques of probabilistic sampling.

**Findings/Conclusions:** There are management activities outside the parameters established by the appropriate sanitary and welfare practices of cattle. However, the personal features indicate the existence of conditions related to the livestock activity in Mexico, that encourage participants to propose and carry out programs, plans, and strategies aimed at promoting and applying practices on animal welfare, thereby improving the productive, reproductive and profitability parameters.

**Keywords:** Cattle, personal features, animal welfare.

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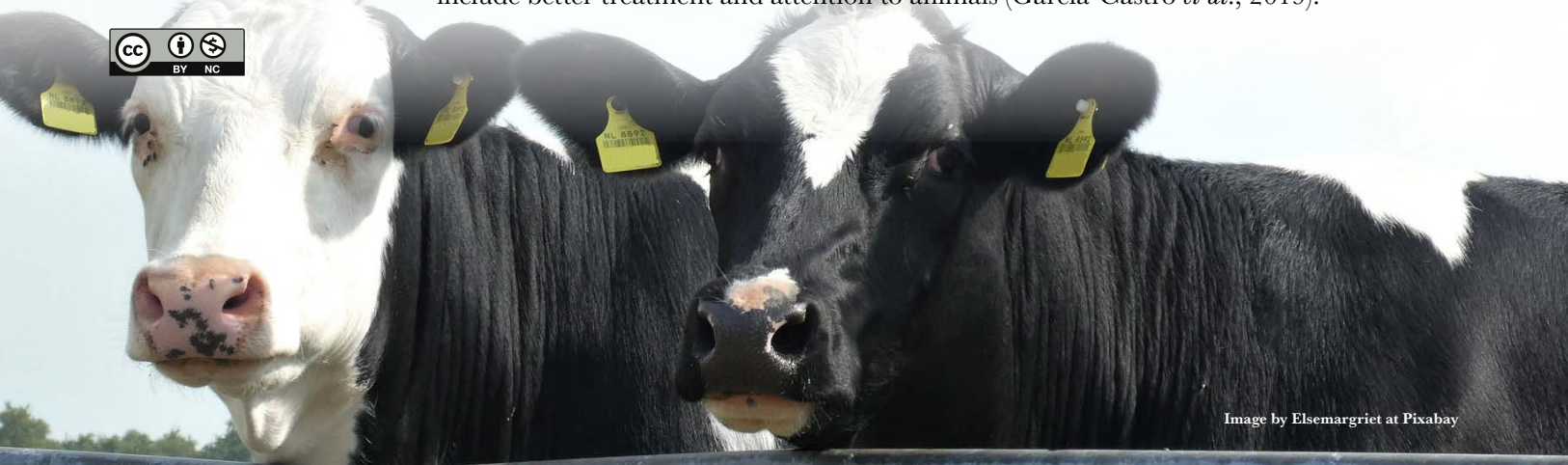
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## INTRODUCTION

The issue of cattle welfare acquired greater relevance, particularly in the first two decades of this century, given its association with the increase in productive and reproductive parameters, as well as economic benefits (Ramírez-Iglesia *et al.*, 2016). Additionally, consumers are concerned and exercise pressure regarding livestock breeding or the production of food of animal origin, of which they are the final consumers. Consequently, improving the conditions and traditional management enables ranching practices which include better treatment and attention to animals (García-Castro *et al.*, 2019).



Despite the above, the study of activities related to animal welfare in Mexico does not constitute yet a priority objective in agricultural and livestock development plans. In fact, researches about indicators that make it possible to measure welfare in cattle herds—in which the characteristics of each region, municipality or locality are considered—remain scarce. Another problem that has been detected within the Mexican agricultural and livestock sector is that—even if technicians, researchers, government agencies, and others make suggestions about the adoption of technologies, techniques or methods aimed at increasing the livestock productivity—these suggestions have not been adopted or incorporated into the production process, because the personal features of the producers are not taken into account (Salas-González *et al.*, 2013).

In addition, not only does Mexico have a wide range of climates and geographic conditions, but also a cultural, social, and economic diversity that generates variations in idiosyncrasy, traditions, customs, manner, and treatment towards cattle, from one geographic space to another, or even within the same space. (Juárez-Barrientos *et al.*, 2015). Therefore, research on animal welfare is expected to have an impact in at least three aspects: a) to contribute with producers to improve livestock management conditions that will be reflected in higher productive, reproductive and financial parameters; b) to generate public policies for a more humane and comfortable animal production; and c) to guarantee that consumers can purchase higher quality products of animal origin, produced under welfare conditions.

In the case of Loma Bonita, Oaxaca, Mexico, some effort has been made to characterize cattle production units, both in this municipality and in surrounding towns. However, there is a lack of information regarding producers and management activities related to the welfare of the cattle, even though cattle ranching is one of the main economic activities of the area. The objective of this study was to describe the personal features of the producers, as well as the management activities related to cattle welfare in production units of the municipality of Loma Bonita, Oaxaca, Mexico.

## **MATERIALS AND METHODS**

### **Study Area Location**

The work was carried out in cattle production units of the municipality of Loma Bonita, Oaxaca, which is located between the following geographic coordinates: 95° 53' W and 18° 06' N; at 30 masl (INEGI, 2002). The climate is hot subhumid (Aw2(i')g), with a >1600 mm average annual precipitation, and 25 °C annual average temperature (García, 2004), with maximum temperatures exceeding 40 °C.

This is a cross-sectional, descriptive, and quantitative research (Cortés-Cortés and Iglesias-León, 2004). The population under study were dairy cattle producers. The reporting units were the owners and/or managers of the production unit.

The sampling was non-probabilistic for convenience, with the support of the person in charge of the Regional Ranchers' Association of Loma Bonita. Twenty-seven surveys were applied from December 2019 to March 2020. The questionnaire was composed of four personal factors: age (years), gender, experience in the activity, and schooling. According to the literature (Barba *et al.*, 2015; Pérez and Larios, 2018; Cuevas-Reyes, 2019; Flores

-González *et al.*, 2019), these factors can influence the adoption of technology and/or new knowledge by producers. The management activities related to cattle welfare included seven practices: 1) roundup, 2) colostrum supply, 3) navel cutting, tying, and disinfection 4) dehorning, 5) dehorning method, 6) hand washing, and 7) udder washing or cleaning. The information was registered in an Excel sheet and analyzed using descriptive statistics—such as mean, standard deviation, ranges, and percentages—to describe the producers and management activities.

## RESULTS AND DISCUSSION

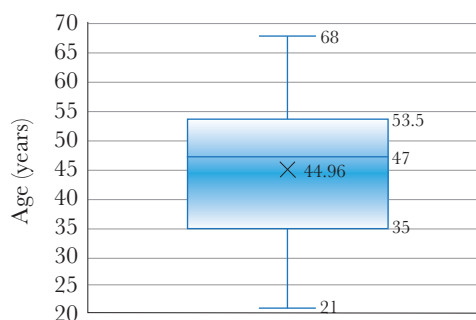
### Personal Features

The average age of the 27 producers was 44.96 years ( $\pm 13.7$  years), the oldest producers were 68 years old, and the youngest were 21 years old. Most of the producers had approximately 35 years (Figure 1). The average age below 50 years is similar to the results reported by Oros *et al.* (2011) and Flores-González *et al.* (2019).

According to the SAGARPA-FAO (2014) criteria, the average age of the cattle ranchers in the municipality of Loma Bonita, Oaxaca, is indicative of a young rural population (up to 50 years old). This situation gains traction, because young producers are considered to be more susceptible to adopt new technologies, knowledge, techniques, etc. than old producers (more than 50 years old) (García-Salazar *et al.*, 2018; Pérez and Larios, 2018). In theory, this would facilitate the training of producers on issues related to cattle welfare, through technical assistance, in the municipality of Loma Bonita, Oaxaca.

Regarding gender, 96.3% of the participants were men and there was only one woman, which indicates that this is a male-dominated activity. Vilaboa-Arroniz *et al.* (2009) and Martínez *et al.* (2012) also report similar findings in cattle ranching from municipalities and communities of the Papaloapan region, Mexico. These results perhaps indicate that this activity involves a great deal of physical work, that management is up to a certain point carried out far from the producer's home, and that it requires investing a considerable amount of time and assuming risks, both in the herding and inside the production unit. It is also possible that the land ownership remains under a patriarchal model, in which women do not have access or control over livestock activities.

This is important because some researches (Martínez and Gómez, 2012; Barba *et al.*, 2015) had reported that the chances of adopting a technology are greater when the person in charge of an agricultural and livestock production unit is a man, because they have



**Figure 1.** Age of cattle producers from Loma Bonita, Oaxaca, Mexico.

more access and decision-making power regarding the use of technologies than women. According to the results obtained in this study, this situation would also favor the spreading and adoption of practices aimed at animal welfare.

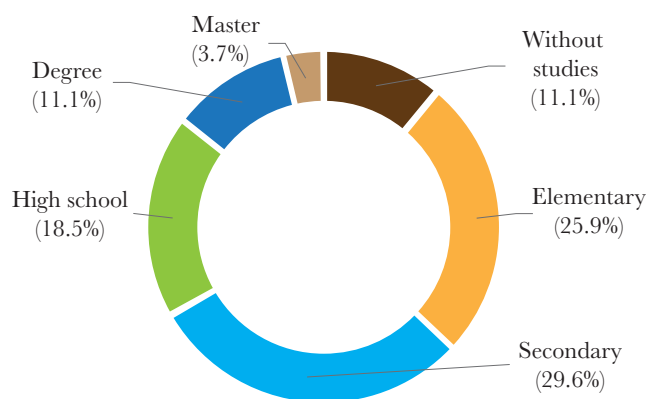
Regarding the level of schooling, 7 (25.9%) and 8 (29.6%) producers had attended elementary and secondary education (55.5% of the producers). The remaining 44.4% was distributed among those who had had attended high school (18.5%), obtained an undergraduate or postgraduate degree (14.8%), and those who did not have studies (11.1%) (Figure 2). These results indicate that more than 60% of the producers have studies above elementary school, which contrasts with the findings of Chalate-Molina *et al.* (2010), Oros *et al.* (2011), and Martínez *et al.* (2012), for dual-purpose cattle production systems under similar agroclimatic conditions, in the states of Chiapas, Morelos, and Veracruz, respectively, where the schooling average was  $\leq 6$  years. Mejía and Oliver (2005) and Flores-González *et al.* (2019) reported higher percentages of producers with elementary education.

There is a positive relationship between the level of schooling and the ability to adopt technology, since the adoption possibilities are greater at higher level of schooling (Vargas-Canales *et al.*, 2018; Cuevas-Reyes, 2019), which would also favor the promotion of technical assistance and the training of producers on animal welfare issues.

With regard to experience, 44.4% said they had been practicing cattle ranching for less than 20 years and the remaining 55.6% (15 producers) said they had more than 20 years of experience. Vilaboa-Arroniz *et al.* (2009), Oros *et al.* (2011), Torres *et al.* (2014), and other authors also report an average experience of more than 20 years. Experience in agricultural and livestock activities is also considered essential for the adoption of technologies and knowledge. Therefore, producers who have been carrying out an activity for the longest time are more likely to adopt the technology (Vargas-Canales *et al.*, 2018). This can benefit training and technical advice programs aimed at the implementation of strategies and plans that favor cattle welfare in the municipality of Loma Bonita, Oaxaca.

### Animal Management and Welfare Activities

With regard to roundup methods, 74.1% of the producers said that they whistle and speak to the animals; the remaining 25.9% (7) mentioned that they hit them with sticks



**Figure 2.** Level of schooling of the cattle producers of Loma Bonita, Oaxaca, Mexico.

and yell at them before taking them to be milked (Table 1). These results show the use of the three existing types of operator-animal interactions; the highest percentage belongs to the auditory and visual interactions. In general, a calm roundup could be observed in most of the ranches; the animals were docile and obedient. These observations support the findings of Herrán *et al.* (2017), who found that these interactions generate few behavioral responses and calmer cattle management.

In relation to colostrum supply, all producers declared that they helped the newborn calves to suckle; this process allows them to obtain their first nutrients outside the womb and to develop antibodies to face future diseases. The results are similar to the findings of Mejía and Oliver (2005), who reported that calves in municipalities in the Colombian high tropics obtained colostrum mainly from their mothers, followed by colostrum from a colostrum bank. Natural breastfeeding and the use of a bottle are the two methods through which they are supplied colostrum. Additionally, Reyes *et al.* (2011) suggested washing the udder of the cow before allowing the calf to suckle, to avoid the transmission of infections to the calf, as part of the colostrum supply and cattle welfare in tropical regions. Calves should be allowed to suckle as much colostrum as they want for the first three to four days after calving. If the calf does not suck all the colostrum, the excess should be milked to prevent engorgement and damage to the udder.

Regarding the birth of the calves, 17 producers (63%) stated that they cut and tie the navel and apply methylene blue to prevent possible infections in newborns, while the remaining 10 (37%) accepted that they do not apply anything. The percentage of producers who heal the navel (67%) is lower than the 86% —regarding the healing of calves with iodine in milk-producing farms located in the high tropics of Colombia— reported by Mejía and Oliver (2005).

Twenty-one farmers (77.8%) stated that they still dehorn their animals, while the remaining 22.2% mentioned that they no longer do it. Out of the 21 producers who dehorn their cattle, 16 (76.2%) use scissors or hot iron; the remaining 23.8% apply paste. In this regard, Ordoñez and Caicedo (2016) pointed out that cutting and cauterizing with hot iron is the most painful disbudding method, which represents another area of improvement for Loma Bonita producers.

Regarding the washing or disinfection of hands before milking, 6 producers (22.2%) neither wash nor disinfect their hands; while the remaining 77.8% affirmed that they do.

**Table 1.** Management activities related to cattle welfare in Loma Bonita, Oaxaca, Mexico.

The producer or person in charge of the production unit...	Yes (%)	No (%)
1. Gathers the cattle hitting them when he takes them to be milked	25.9	74.1
2. Supplies colostrum within the first hours after calving	100.0	0.0
3. Ties, cuts, and disinfects the navel of newborn calves	63.0	37.0
4. Dehorns calves within the first three months of age	77.8	22.2
5. Dehorns with scissors or hot iron*	76.2	23.8
6. Washes his hands before milking	77.8	22.2
7. Washes or cleans the udder before milking	51.9	48.1

\*Percentages calculated based on the 21 producers who dehorned with scissors or hot iron.

Additionally, 13 producers (48.1%) do not wash or clean the udders. These results match the findings of Calderón *et al.* (2009) and Mendoza *et al.* (2017), who warn that the lack of hygiene or and the implementation of poor practices prior to and during milking are associated with mastitis, resulting in a reduced production, increased treatment costs, and reduced milk quality. In the case of Loma Bonita, it is worth mentioning that 16 (59.3%) out of the 27 producers reported mastitis problems in their farms, which could be associated with these bad practices.

## CONCLUSIONS

Based on the personal features of the 27 cattle producers from the municipality of Loma Bonita, Oaxaca, included in the sample used for this research, we conclude that there are conditions that encourage the different actors of livestock activity in Mexico (extensionists, researchers, etc.) to propose and carry out programs, plans, and strategies aimed to promote and apply good cattle practices. These programs, plans, and strategies should be focused on providing welfare within the production units, particularly in those that have human-animal interaction, including: rounding-up without hitting the animals; cutting, tying, and disinfecting the navel of newborn calves; dehorning calves; and washing and/or disinfecting hands and udders.

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