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CHARACTERISTICS OF MEAT, PET, AND RESEARCH RABBIT FARMS IN BRAZIL: AN OVERVIEW BASED ON TWELVE FARMS

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Abstract: Rabbit production has great growth potential in a country where animal production is very important. However, there is little data about this industry in Southern and Southeast Brazil. The aim of this study was to describe Brazilian rabbit farms that provide meat, pets and animals for learning or research. Three pet farms, four meat farms and five research rabbit farms were visited, and the production and farm characteristics data were collected between June 2018 and March 2019. A total of 1170 rabbits and 617 cages were evaluated. Most farms had 21 to 60 (58.3%) does. Considering all farms, the farmers reported an average rate of conception of 71.8%, prolificacy rate of 6.7 kits per parturition, average interval between parturitions of 65 d and 6.3 parturitions/doe yr. The mean mortality rate for breeding rabbits was 10.4%, compared to 1.7% for growing rabbits (rabbits post-weaning until slaughter or sale). The average area of a cage was 0.43±0.1 m^2, with an average stocking density for growing rabbits of 3 rabbits/m^2. The most common cage system used by farmers was a flat-deck (66.7% of farms) system with a wire cage (91.7%). Metal (41.7%) and clay (33.3%) feeders were the most common types of feeders, and automatic nipple drinkers were present in 75% of the farms. Dirt accumulation was observed in 11.2% of the cages and 5.7% of the drinkers, but not in feeders. A total of 4.1% of the cages were considered unsafe, and 0.8% had problems with the drinkers. The farms studied ranged from small to medium in size, used an extensive reproductive rhythm and followed basic production techniques. Animal health and management aspects need to be reviewed by the farmer if the rabbit production conditions are to improve.

Key Words: Brazil, facilities, rabbitry, reproductive performance, structural characterisation.

INTRODUCTION

In Brazil, data on rabbit production are deficient and the last Brazilian census (2016) reported that a total of 200 345 rabbits were distributed across 16 095 farms (IBGE, 2017). The Food and Agriculture Organisation (FAO) estimated that there were about 166 000 head in 2018 (FAOSTAT, 2020). However, information about rabbit production in Brazil could be considered inaccurate because, for instance, some cities that produced rabbits and contained pet rabbit production were not included in this census, as reported by Machado and Ferreira (2014) for the Brazilian census of 2012. Furthermore, there are no government incentives for rabbit production (Machado and Ferreira, 2014). Consequently, they are not seen as an important livestock production source in the country. Meat and sub-product meat distribution, high production costs, few specific product outlets for rabbits, lack of incentives for rabbit production and low profits/prices for farmers have been reported as limiting factors for the industry (Bonamigo *et al.*, 2015). Besides pet and meat production, rabbits in research farms are used to maintain genetic resources and for research purposes in the country (Ferreira *et al.*, 2012). However, the small size of the rabbit production sector contributes to the fact that 73.14% of the Brazilian population does not know what cuniculture is (Machado, 2015). The Brazilian population views the rabbit as a mixed-purpose animal. Around 11.1% of Brazilians reported that rabbits were only used for meat production, 41.1% said that they were used as pets, and 38.6% said that they were

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used as pets and for meat (Machado, 2015). These facts suggest that there are potential new markets that could be exploited by rabbit farmers and show the importance of the pet and research markets in the country. Furthermore, a lack of opportunity was the main justification for the non-consumption of rabbit meat by the interviewees (Bonamigo *et al.*, 2015), which suggests that facilitating access to the product and the promotion of rabbit meat could potentially increase consumption by the population.

However, before implementing measures to encourage rabbit production in the country, it is important to know more about the state-of-the-art production systems used in Brazil. The objective of this study was to describe some characteristics of Brazilian rabbit farms that cater to three different markets: meat, pet and research.

MATERIALS AND METHODS

Twelve rabbit farms in South and Southeast Brazil (São Paulo, Minas Gerais, and Paraná State) participated and were visited between June 2018 and March 2019. Of the 12, nine farms are in a sub-hot tropical climate, with a mean temperature of 15-18°C in, at least, one month per year, whereas the rest of the months have weather varying from semi-humid (4 to 5 dry mo), to humid (1 to 3 dry mo), and super humid (sub dry or without dry months), depending on the county where the farm is located. Three farms are in a mild mesothermic temperate climate, with a mean temperature of 10-15°C, and are present in counties with super humid conditions, without dry or sub dry months. Of all farms, there were four meat farms, three pet rabbit farms and five rabbitries in research farms. Research farms included those farming rabbits for learning and research institutes, such as colleges and universities that use rabbitry as an educational tool for undergraduate courses, rabbit research, and to sell rabbits for a specific research or general public use (farmers). This study was approved by the Animal Use Committee of Pontifícia Universidade Católica do Paraná (PUCPR) under protocol number 01200.

Of the twelve farms that participated in the study, 617 cages and 1170 rabbits (178 bucks, 149 lactating does, and 843 growing rabbits) were evaluated. This evaluation consisted of collecting data on facilities, such as cages, feeders and drinkers, farm characteristics and zootechnical data. All farms used a cage system, except for one meat farm that had a pen (36 growing rabbits) in addition to the cages. For standardisation purposes, only data from the cage systems were included in the housing evaluation. The number of cages and animals evaluated (Table 1) varied

Table 1: Brazilian rabbit farm characteristics, according to purpose and the total number of farms rearing rabbits for each market.

	Farm purpose			
Parameters	Pet (n = 3)	Meat (n = 4)	Research (n = 5)	All farms (n = 12)
Cages (n)	148	239	230	671
Rabbits (n)	189	537	444	1170
Breeds (n)	11	3	3	18
Building per farm (n)	1.0	1.3	2.0	1.5
% (n) of farms				
≤20 does	33.3 (1/3)	0.0 (0/4)	0.0 (0/5)	8.3 (1/12)
21-60 does	33.3 (1/3)	75.0 (3/4)	60.0 (3/5)	58.3 (7/12)
≥61 does	33.3 (1/3)	25.0 (1/4)	40.0 (2/5)	33.3 (4/12)
Conception rate (%)	73.3	74.9	68.4	71.8
Prolificacy (n)	4.3	7.9	7.2	6.7
IBP (d)	93.3	44.5	64.4	65.0
Parturitions/doe yr (n)	4.1	8.3	6.1	6.3
Replacement rate (%)	30.0	16.7	44.0	31.4
Mortality rate (%)				
Breeding	6.5	24.6	3.5	10.4
Growing	2.3	1.7	1.4	1.7

IBP: Interval between parturitions.

between the types of farms; according to the size of the farm, any sale or slaughter of rabbits before the visit, and the reproductive rhythm for bucks and does adopted by the farm.

Cages, feeders and drinkers were evaluated according to type, functionality, cleanliness, security and density. The cage system was identified as battery (set of cages, one above the other, on two or more floors, with the front cages open), flat deck (composition of cages in one line, supported by metal/wood stand or suspended by wire/chains; the cage opens from the front or from the top) or Californian (cages in two floors, with one floor higher than the other but not above it; the lower level cages open at the top and those on the upper level at the front).

The type of cage was described as having a main structure where the floor and walls were made of wood or wire. The footrest evaluation consisted of observing the presence or absence of good-quality footrest in the cage. Footrest was a board placed in the cage that occupies part of the mesh wire floor, to prevent the occurrence of pododermatitis. A good-quality footrest was considered as one that was clean, unbroken and without signs of erosion. The width, length and height of the cage was measured to describe its area and stocking density. An observation of the cleanliness of the cage was made; it was considered a dirty cage if more than 25% of its total area was covered with faeces, urine, fur, or other organic material. The safety of the cages was evaluated by observing the presence or absence of elements that can potentially cause rabbit injuries, such as holes in the floor, loose wire or rust. Data was also collected on feeders and drinkers, with descriptions of their characteristics (type and placement) and maintenance (cleanliness, functionality) being recorded. Rabbits in the final third of their growing phase were evaluated only on rabbit meat farms. Pet rabbits are sold off earlier than meat rabbits. Therefore, all rabbits available for sale were evaluated. These same criteria were also used for the rabbits destined for research farms.

In addition, farm characteristics, such as purpose (meat, pet, or research), breed raised, size (number of breeding does and number of buildings) and zootechnical data were evaluated. The conception rate was defined as the number of pregnant does over total number of matings for a one-year period. Prolificacy was defined as the total number of liveborn kits per parturition. The interval between parturitions was the number of days between two parturitions. Parturitions/doe/year was defined as the number of parturitions per doe in a year. The replacement rate was the percentage of does replaced over a one-year period. Mortality rate of growing rabbits was defined as the percentage of dead growing rabbits (after weaning until sale) from the number of total weaned rabbits in the last three months. Mortality rate of breeding was defined as the percentage of dead does and bucks from the total number of does and bucks on the farm in the last three months. These data were provided by the farmer, except for the number of parturitions/does/year, which was calculated by the number of days of the year (365) divided by the interval between parturitions.

All evaluated parameters and their definitions are described in Table 2. Descriptive statistics were calculated using Microsoft Excel Office 365, Redmond, USA.

RESULTS AND DISCUSSION

Animals

All farms had unique characteristics, with differences in management, production and housing conditions. Therefore, this study focused on describing these characteristics and not on comparing the different types of production.

The rabbit breeds observed were in accordance with the descriptions of rabbit breeds in Brazil (Ferreira *et al.*, 2012; Heker, 2015). The breeds were American Fuzzy Lop, Angora, Botucatu, Bouscat Giant, French Spot, California, Champagne Silver, Chinchilla, Cream Silver, Flanders Giant, Fuzzy Lop, Holland Lop, Lionhead, Mini Angora, Mini Dutch, Mini Lion, Mini Lop, Mini Rex, Netherland Dwarf, New Zealand White, Polish, Hotot, Rex, Teddy Dwerg, and crosses between these breeds. Pet farms used pure breeds, meat farms and research institutes used pure or crossbreds in the production.

All farms had complete production cycles from breeding until fattening. The use of only one building was common, with an average of 1.5 buildings/farm. Separating breeding from growing rabbits in different rooms occurred on four farms (33.3%), whereas no pet farms separated their rabbits. Most farms (58.3%) had between 21 and 60 does, and four farms (33.3%) had more than 60 (Table 1). Two farms had close to or more than 100 does. The results from this

Table 2: Parameters evaluated when assessing the rabbit farms, cages, feeders, and drinkers.

Variable Parameter	Definition
Farm	
Purpose	Meat, pet, or learning/research purposes
Breed	Breeds raised on the farm
Number of breeding does	All breeding female rabbits on the farm (pregnant, lactating, and in maintenance)
Number of buildings	Buildings on the farm
Separation in rooms	The farmer separates growing rabbits from breeding rabbits in different rooms
Conception rate	Percentage of mated does that produced offspring
Prolificacy	Number of live offspring per parturition
Interval between parturitions	Number of days between two parturitions
Parturitions/doe/year	Number of parturitions per doe per year
Replacement rate	Percentage replacement of does per year
Mortality rate	Percentage of animals that died over the last three months
Cage	
System of cage	Battery, flat-deck (with metal/wood stand or suspended by wire/chains), Californian system
Type of cage	Wood, wire
Area	Measured by multiplying the length by the width of the cage
Height	Measured from the bottom to the cage ceiling
Stocking density	Growing rabbits: number of rabbits/m^2
Footrest	Presence of a clean and good quality footrest. If it was in a bad state of maintenance, it was considered to be the same as not being present at all. Observed for breeding rabbits.
Cleaning	Clean (0% of dirtiness), partially dirty (1 to 25% of the cage was dirty) and dirty (more than 25% of the cage was dirty)
Safety	Safe: without elements that can wound the rabbit; Not safe: presence of components in the cage that can cause injury (for example, loose wire, holes, or rust)
Feeder	
Type	Feeder material used (metal, clay, or plastic)
Placement	Inside or outside the cage
Cleaning	Clean: no dirt in the feeder; Dirty: any dirt (such as faeces or mud) in the feeder.
Drinker	
Type	System (automatic, manual, or both)
Functionality	Proper functioning: no problems with the drinker; Malfunction: the drinker is dripping or does not release water properly
Cleaning	Clean: no dirt on the drinker; Dirty: dirt (such as faeces, mud, or rust) on the drinker

study are similar to those reported by Ferreira *et al.* (2010) for small or medium farms and those reported by Colin and Lebas (1996) for South American countries, where most farms had fewer than 100 does. In recent years, the tendency for most rabbit farms to have between 20 and 60 does was also reported in some studies from Argentina and Costa Rica (Andrea, 2014; Quagliariello, 2014).

Zootechnical data

The average annual conception rate at all farms was 71.8%, with an average of 6.7 kits/doe. Pet farms focus on the production of small breeds that have lower prolificacy than medium/large rabbit breeds (Marciano *et al.*, 2018), which

was confirmed by the results of this study (4.3 rabbits/doe). Farmers need to produce and deliver many animals on a frequent basis to the slaughterhouse if rabbit meat production is to be profitable in Brazil. This leads to shorter intervals between parturitions (average of 44.5±4 d) than in extensive reproductive rhythms (60 d; Ferreira *et al.*, 2012). Consequently, a larger number of parturitions/doe yr was observed (8.3) compared to Ferreira *et al.* (2010), who reported six to seven parturitions/doe yr. However, the differences between the literature and these findings may be that our data were acquired via responses from the farmers, most of whom did not keep a record of the farm data, so there could have been a bias introduced by the data provided to us, which may differ from that in reality. This should be considered for zootechnical data in general, as all the information was provided by the farms. Neighbouring countries, such as Venezuela and Colombia, have similar rabbit production limitations to Brazil, and report the number of parturitions/doe yr as between 6 and 8 (Cortazar and Martinez, 2006; Osechas and Sánchez, 2006), similar to that reported by Ferreira *et al.* (2010) for Brazilian conditions. Therefore, it is possible that these values were overestimated by the farmers in our study. Pet rabbit farmers vary this parameter during the year depending on market demand, especially for specific breeds. In addition, they have fewer breeding rabbits and multiple breeds on the same farm. Therefore, the animal is often kept in a breeding state for as long as possible because it is difficult and expensive to acquire new animals. The use of a long interval between parturitions (average of 93.3±25 d) allows a better recovery time for the doe. The high price of pet rabbits in the market allows this type of management by pet farmers, which does not occur on meat farms. In general, the management of research farms follows the meat farm model. The conception rate average (68.4%) recorded in this study was lower than the 73 and 83.8% generally recorded for different research rabbitries across the country (Ribeiro and Machado, 2011; Silva *et al.*, 2017). This could be because research farms are mainly influenced by research requirements (Ribeiro and Machado, 2011). These specific requirements may influence the reproductive rhythm and lead to differences in the rabbit environment and their nutrition. In addition, the conception rate is influenced by several factors, and the season may have also influenced the data collected (Marai *et al.*, 2002; Tůma *et al.*, 2010; Khalil, 2018).

The evaluated meat rabbit farmers reported cyclical increases in slaughterhouse demand, followed by reduced or no demand for some weeks/months. Thus, some farmers had stabilised or decreased the number of breeding does in the year before the visit. The replacement rate may have been influenced by fluctuations in the Brazilian rabbit meat market over recent years. Therefore, the replacement rate was low (16.7%), even though the mortality rate was high for breeding rabbits (24.6%). Usually, pet farms maintain a stable number of breeding rabbits because the high value of some breeds means that an increased effort is made to keep healthy females in the reproductive cycle as long as possible. In addition, the reduced supply and high demand means that farmers can maintain the price of the rabbit at a good level. In general, research farms have limited space for rabbits. Therefore, the maintenance of a constant number of does is common (Ribeiro and Machado, 2011). Replacing a large number of does requires space for maintenance and the selection of offspring for future breeding females, or requires the purchase of new does from another farm, both of which increase the cost of the rabbit breeding activity and, in the latter case, could expose the farm to disease.

The average weaning age was 32.9±3 d, with a minimum of 28 d and a maximum of 35 d. Regardless farm's purpose, the weaning age remained within the range recommended by Ferreira *et al.* (2012) for Brazilian conditions. The weaning age choice varies with many factors, such as with reproductive management of the doe at the farm. This parameter therefore varies between Latin American countries, with the interval mean varying from 30-34 d in Mexico (Becerril-Pérez, 2006) to 37-40 d in Colombia (Cortazar and Martinez, 2006).

Facilities

Sheds

The use of half-open lateral sheds with curtain control is the standard Brazilian rabbit production method (Ferreira *et al.*, 2010) and was observed in this study. All farms used a manual curtain system to control the environmental temperature. However, one farm also used an automatic complement system (ventilator). Nevertheless, on 83.3% of the farms there were no environmental thermometers and 100% of the farms did not have routine use of lighting schedule control for growing rabbits. One farm used lighting schedule control in breeding rabbit shed.

Cages

The most common cage size was a length of 80 cm, a width of 60 cm, and a height that varied between 40 and 45 cm; although the size of the cages varied between and within the farms (Table 3). The average area of the cage was 0.43±0.1 m^2 (minimum: 0.18 m^2; maximum: 0.88 m^2). For breeding rabbits, the rabbit breeds weighing less than 2 kg had cages with the smallest area, and medium-sized rabbit breeds had the largest cages. The height of the cage varied from 30 to 60 cm, with an average of 42.8±3.9 cm. The stocking density for growing rabbits varied from 1.1 to 5.9 rabbits/m^2, with an average of 3.0 rabbits/m^2 (Table 3).

The flat-deck cage system was the most common system (66.7%), with pet farms having the largest system variation. Of the farms that used a flat-deck system, 50% used a suspended flat-deck system (suspended by steel wire ropes) and 50% used a supported flat-deck system (wooden or steel support). Pet farms had the largest variety of cage types, and wire mesh was the material most used for cage fabrication. The lack of good quality facilities, mainly cages, is one of the most critical issues for rabbit production in Brazil (Machado and Ferreira, 2014). This leads farmers to find other solutions, such as the use of wood, to build the cage or its support. Several different materials were used as footrests, such as plastic, wood and floor tiles of various sizes, which covered a quarter to half of the cage. A total of 56.9% of the breeding cages had a well-maintained footrest. Approximately 75.8% of cages on the pet farms had good footrests. According to Valentim *et al.* (2018), many factors could influence the decision to adopt and maintain footrests on the farm, such as the higher value of the animals, as well as farmers having easy access to information and knowledge about the importance of animal welfare. Of all the cages evaluated, 88.8% were clean, 11.0% were partially dirty and 0.2% were completely dirty. A total of 4.1% of the cages were considered unsafe. Cleaning, disinfection and cage maintenance are essential when attempting to reduce health problems, such as pododermatitis and enteric diseases, which can be caused by contamination of the cage with faeces. This management is part of the biosecurity programme recommended for rabbit farms (EFSA, 2005; EFSA, 2020). A failure in some of these factors may have contributed to the mortality levels observed in this study.

Drinkers and feeders

Nipple drinkers were the most common drinkers (75%). The use of an automatic and manual drinker (bowl) at the same farm was observed in 16.7% of the farms (Table 4). A total of 41.7% of the farms used inside feeders. Various materials were used to make the feeders, with clay bowls being the most common. None of the farms used an automatic feeder system. The use of an automatic nipple and outside feeders reduces farm labour requirements (El-Raffa, 2004). However, functionality was compromised in 0.8% of the evaluated cages. Dirty drinkers were observed in 5.7% of the cages, but there were no dirty feeders. Excess humidity or the accumulation of organic matter are avoided with the correct management of facilities. A hygiene schedule needs to be adopted in farms to avoid these situations (El-Raffa, 2004).

Table 3: Area (mean±SD), height (mean±SD), stocking density (growing rabbits/m^2), and cage system and type (%, n) on Brazilian rabbit farms.

	Farm Purpose			
Parameters	Pet±SD	Meat±SD	Research±SD	All farms±SD
Area (m^2)	0.32±0.1	0.44±0.1	0.48±0.0	0.43±0.1
Height (cm)	46.0±4.3	39.9±2.2	43.7±2.8	42.8±3.9
Stocking density (growing rabbits/m^2)	1.6	3.4	3.9	3
Cage system (% and n of farms)				
Battery	33.3 (1/3)	0.0 (0/4)	0.0 (0/5)	8.3 (1/12)
Flat-deck	33.3 (1/3)	75.0 (3/4)	80.0 (4/5)	66.7 (8/12)
Californian	33.3 (1/3)	0.0 (0/4)	0.0 (0/5)	8.3 (1/12)
Mix	0.0 (0/3)	25.0 (1/4)	20.0 (1/5)	16.7 (2/12)
Cage type (% and number of farms)				
Wood	33.3 (1/3)	0.0 (0/4)	0.0 (0/5)	8.3 (1/12)
Wire	66.7 (2/3)	100.0 (4/4)	100.0 (5/5)	91.7 (11/12)

SD: standard deviation; Mix: Had two different cage system on the same farm.

Table 4: Feeder and drinker characteristics on Brazilian rabbit farms.

Parameter	Pet	Meat	Research	All farms
Feeder Type % (n) of farms				
Metal	33.3 (1/3)	25.0 (1/4)	60.0 (3/5)	41.7 (5/12)
Clay	33.3 (1/3)	50.0 (2/4)	20.0 (1/5)	33.3 (4/12)
Mix	33.3 (1/3)	25.0 (1/4)	20.0 (1/5)	25.0 (3/12)
Feeder Localisation % (n) of farms				
Outside	33.3 (1/3)	25.0 (1/4)	60.0 (3/5)	41.7 (5/12)
Inside	33.3 (1/3)	75.0 (3/4)	20.0 (1/5)	41.7 (5/12)
Mix	33.3 (1/3)	0.0 (0/4)	20.0 (1/5)	16.6 (2/12)
Feeder Cleanliness % (number of cages)				
Clean	100 (148/148)	100 (239/239)	100 (230/230)	100 (617/617)
Dirty + partially dirty	0.0 (0/148)	0.0 (0/239)	0.0 (0/230)	0.0 (0/617)
Drinker Type % (n) of farms				
Automatic	33.3 (1/3)	75.0 (3/4)	100.0 (5/5)	75.0 (9/12)
Manual	33.3 (1/3)	0.0 (0/4)	0.0 (0/5)	8.3 (1/12)
Mix	33.3 (1/3)	25.0 (1/4)	0.0 (0/5)	16.7 (2/12)
Drinker Cleanliness % (n) of cages				
Clean	98.0 (145/148)	96.7 (231/239)	89.6 (206/230)	94.3 (582/617)
Dirty	2.0 (3/148)	3.3 (8/239)	10.4 (24/230)	5.7 (35/617)
Drinker Functionality % (n) of cages				
Good	100 (148/148)	99.2 237/239)	98.7 (227/230)	99.2 (612/617)
Bad	0.0 (0/148)	0.8 (2/239)	1.3 (3/230)	0.8 (5/617)

Other considerations

It was difficult to obtain accurate production and reproduction data. Implementation of a data storage system, such as the use of specific software for rabbit farms, could help the acquisition of more accurate data for each farm. It could also help farmers make decisions that would improve productivity.

Research farms are important core genetic sources for rabbit farmers in Brazil (Ferreira *et al.*, 2012) and engage in rabbit production research (Ferreira *et al.*, 2010; Machado and Ferreira, 2014). The importance of research centres and institutes for rabbit research and genetics is also seen in other Latin American and Caribbean countries, such as Cuba (Becerril-Pérez, 2006; Cuttis and Ponce de León, 2006) and Costa Rica (Andrea, 2014). Pet farms have increased in number and size in recent years, which reflects the growing acceptance of rabbits as a pet animal by Brazilians (Heker, 2015). Other countries also report that farmers are choosing to breed rabbits for sale as pets, such as in Costa Rica (Andrea, 2014). In 2020, with the COVID pandemic, sales of pet rabbits increased in Brazil (ACBC, 2020a). Meat farms have not evolved in size or technology in recent years, mainly due to the high cost of production and market/slaughterhouse inconsistencies (Machado and Ferreira, 2014). The pandemic situation had negative impacts on feed prices in the country, which could worsen the situation for these farmers (ACBC, 2020b). The use of different materials for facilities, such as cages and feeders, was described in small-scale rabbit farms in Mexico (Becerril-Pérez, 2006; Rivera *et al.*, 2011), and is consistent with those observed in this study.

Few studies on the recent rabbit production situation in South American countries are available and most approach it from an economic viewpoint, which is a critical limitation for rabbit production in these countries (Cuttis and Poncé de Léon, 2006; Salas, 2006; Moura, 2010). Countries of Latin America and the Caribbean have similar limitations in rabbit production to those found in Brazil, such as seasonality, less-adapted genetic material, lack of technical assistance, lack of good quality equipment and feed, suffering from underdeveloped rabbit production chains and cycles of advancement and regression (Moura, 2010; Andrea, 2014). New studies are needed to understand the detailed rabbit production situation in these countries, including data on performance and facilities. Sharing experiences and knowledge could be important, as well as developing solutions for the problems faced by rabbit production farms in the Americas.

CONCLUSION

The Brazilian rabbit farms visited in this study were small to medium-sized and followed an extensive reproductive rhythm system. The production system was relatively basic, with the use of manual feeding, and where different types of materials for cages, feeders, and drinkers were used.

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