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Birth weight according to type of delivery and sex of Creole lambs and pure MEVEZUG® at Cd. Altamirano, Guerrero – Mexico.

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ABSTRACT

The objective of this study was to determine the birth weight of Creole and MEVEZUG lambs according to sex and type of calving. The records of the former correspond to the years 2006 to 2010 and the later from 2010 to 2019. 1 176 records of data from an ovine herd composed averagely of 110 heads of sheep were analyzed. The sheep of the first years were of different colors as a result of the crossbreeding among the Pelibuey, Black Belly, Dorper and Katahdin breeds, while those of the later were of pure color (light brown and tobacco brown) produced from the selection of the inbred cross of the first period herd. The feeding of sheep through the entire study period based on grazing native meadows and irrigated areas in the dry season, at the time of least forage availability. They were provided with 100 grams of corn grain per animal. The collected data were subjected to analysis of variance and the means were compared by the Tukey and Duncan test ($P < 0.05$) using the statistical software infoStat. Average of male weighed was 2.96 kg with ($P < 0.0001$) and 2.67 kg for females compared to MEVEZUG being 2.65 kg for males and 2.59 kg for females ($P > 0.2819$). In relation to the type of delivery, the values were 3.23, 2.69, 2.13 and 1.95 kg ($P < 0.0001$) for single, double, triple and quadruple deliveries, respectively for Creoles and 2.98, 2.39 and 1.97 kg ($P < 0.0001$) for singles, doubles and triples, respectively for MEVEZUG lambs. It is concluded that the weights of the male and female lambs were heavier for the Creoles compared to the MEVEZUG.

Key words: Creoles, MEVEZUG, lambs, birth type

INTRODUCCION

The production of tropical sheep has increasing importantce in Mexico, due to its adaptability to tropical conditions and efficient utilization of forage resources. This species allows production in small, medium and large scale (González et al. 2002). For several years, it has been identified that in lamb production programs, body weight at birth of lambs depends on the genetic type sheep age, sex, type of birth (simple vs. múltiplo), season and year of birth are factores that exert higher influence on sheep growth. These variables, in turn, significantly affect profitability of production systems, which purpose is to obtain the highest economic benefit in the shortest possible time (Forero *et al*. 2017). Cienfuegos-Rivas *et al*. (2010) mentioned that to achieve the maximum productive performance of an animal, it is necessary to know its genetic capacity and the environmental conditions by which it develop. Results of several authors (González *et al*. 2002, Arias 2006, Macedo and Arredondo 2008, Macias *et al*. 2012, Hinojosa *et al*. 2013 and Forero *et al*. 2017) agree that the factors has impact on birth weight (BW), are parturition number, type of parturition and sex of the offspring. These authors also reported that 30 to 40 % of total variation in birth weight was due to environment.

In the state of Guerrero, Mexico, there is a sheep population of 140,663 heads, and in Tierra Caliente region, there are 38,825 heads (SAGARPA 2016), among which there is a mixture of breeds, including animals from other areas of the country that are not adapted to the conditions of that region. The temperatures in Guerrero is high, relative humidity is low and feeding is deficient, which influence sheep

rearing and production. Therefore, the Faculty of Veterinary Medicine and Zootechnics carried out a research to create a breed of sheep from the region, which was named MEVEZUG. However, there are no studies related to the factores that influence on BW of this breed. Hence, the objective of this study was to know the main non-genetic factors affect the BW of MEVEZUG Creole sheep in the dry tropic of Guerrero, Mexico. However, it is necessary to determine the difference between the birth weight of Creole sheep before the breed formation process and those corresponding to the MEVEZUG breed formation, according to type of parturition and sex.

MATERIALS AND METHODS

The information of 1 176 birth weight (BW) records for, sheep, with births during the years 2006 to 2010 and the later from 2010 to 2019, located in the Faculty of Veterinary Medicine and Zootechnics N.1 in the Municipality of Pungarabato, from Tierra Caliente region from the state of Guerrero, Mexico was used.

This region is located at 18°20'30" North and 100°39'18" West in an altitudinal range of 250 masl. The average temperature is 25°C with average precipitation of 1,200 mm per year. Four seasons are defined. Spring that corresponds to the months from March to May, summer from June to August, autumn from September to November and winter from December to February. There are two well marked seasons, one with rains (from June to November), with mean temperature of 18 °C and rainfall of 1,027 mm, and another dry (from December to May), with average temperatures of 32 °C and 750 mm of precipitation (INEGI 2017 y UNAM 2017).

The creation of the breed began in 2004 with a base herd of 50 crossbred females, Dorper, Pelibuey and Black Belly breeds. From there, several crossings were carried out with studs of different breeds (Dorper, Black Belly, Pelibuey and Kathadin), with four registration periods, during the years 2006-2007, 2008-2009 and 2009-2010 respectively. Animals with light brown or tobacco brown hair were selected, with birth weights averaged at least 2.5 kg, which came from multiple births. Afterwards, inter se crosses were carried out. Feeding consisted basically on rotating grazing in five meadows, with native pastures of the region such as bermuda (*Cynodon dactylom*), Venezuelan grass (*Panicum fasciculatum*), spider three-awn (*Aristida ternipes*), smooth mesquite (*Prosopis laevigata*), cueramo (*Cordia elaeagnoides*), cubata (*Acacia cochlicantha*), pinzan (*Pithecellobium dulce*), huizache (*Acacia farneasiana*), cheeseweed (*Malva parviflora*), morning-glory (*Ipomoea purpure*), zapotillo (*Cuphea aequipetala*), cassia (*Cassia didymobotrya*) and railroadcreeper (*Ipomoea cairica*). These pastures were only irrigated during the dry season.

The reproduction was carried out by natural mating with controlled breeding, which consisted in separating the sheep from the stud, without having any visual, auditory and olfactory contact for a minimum period of one month. The stud stayed an average of 35 d, with the females suitable for reproduction (minimum weight of 25 kg at the first service). The sudden introduction of the males into the herd induces hormonal changes in the females, which lead to ovulation and estrus (male effect). This allowed us to concentrate parturition season in the same month, which guarantees a better care for the newborn and for mothers during and after parturition, as well as having lots of more lambs.

Lambs were left with the mothers in a tillering pen (sheep-lamb link), during the first three days of birth, to verify the consumption of colostrum, disinfection of the navel and place the identification earring. Later, and during the lactation period, they stayed with their mothers during the day (from 9 a.m. to 6 p.m.) during grazing, where they were given water *ad libitum*. At the afternoons, sheep, lambs and replacement females were locked in the same pen, where they were offered 100g/animal/d of maize grain, only within the critical period of forage availability (in the months from February to June).

The collected data were subjected to analysis of variance and the means were compared by the Tukey and Duncan test ($P < 0.05$) using the statistical software infoStat. (Balzarini *et al*. 2012)

RESULTS AND DISCUSSION

In Table 1, it is observed that the birth weight of the females was 9.8 % less than the males for Creole lambs with significant difference (P <0.0001), contrary to weight of MEVEZUG newborns, where females were 2.3 % lighter than males (P> 0.2819), This can possibly attributed to the greater decrease in birth weight males of Creole in relation to MEVEZUG 310 g less, compared to females whose decrease was 80 g. The above is possibly attributed to the formation process of pure MEVEZUG animals. The weight at birth of Creole males, in the present work (2.96 kg) was slightly higher than that reported by Ríos et al. 2014, as 2.8 kg, for crossbreeds of Dorper, Katahdin, Black Belly, Dorper and Pelibuey and the same within females (2.7 kg vs 2.67 kg respectively). In relation to MEVEZUG newborns, the weight was 2.7 kg which was similar to the Katahdin x Black Belly and Pelibuy x Black Belly crosses reported by the affected authors.

Table 1. Number and weight of males and females kg of Creole lambs and MEVEZUG in Cd. Altamirano, Guerrero-México

	Males		Females		
Breed	Numbers	B. Weights	Numbers	B. Weights	P
Creole	261	2.96[a]	254	2.67[b]	<0.0001
MEVEZUG	335	2.65	326	2.59	>0.2819

B= Birth, Numbers in the same row with different literals are statistically different (P <0.05)

In Table 2, it can be seen that the highest birth weight was for Creole lambs with a single birth with higher percentages of 16.72%, 34.05% and 39.63% for newborns with double, triple and quadruple deliveries, respectively. The percentages in MEVEZUG pups were 19.80% and 33.89% superior in single lamb pups compared to double and triple lambs and without the presence of quadruple deliveries.

Rios et al. (2014) reported weights of 3.3, 2.7, and 2.4 kg for single, double and triple lambs respectively, values which is similar to those of the present work for Creole lambs, while slightly lower than lamb weights of MEVEZUG,

Table 2. Number and weight of Creole lambs and MEVEZUG at birth kg according to type of delivery in Cd. Altamirano, Guerrero-Mexico.

Breed	N	Single	N	Double	N	Triple	N	Quadruple	P
Creole	187	3.23[a]	270	2.69[b]	42	2.13[c]	16	1.95[c]	<0.0001
MEVEZUG	282	2.98[a]	352	2.39[b]	27	1.97[c]	-	-	<0.0001

N = Number. Numbers in the same row to type of delibery, with different literals are statistically different (P <0.05)

which represents 9.7% less, in newborns with single lambing, but similar to those with double and triple lambing. The above can attributed to the crossbreeding between pure animals.

Quintanilla et al. (2018), reported birth weights of Black Belly-Dorper-Pelibuey cross as 3.57 ± 0.76 kg, which was greater than the 2.82 ± 0.77 kg and 2.62 ± 0.64 kg of Creole and MEVEZUG lambs in this study. Concerning the type of delivery, the aforementioned authors reported higher weights of 3.74 ± 1.01 kg for single delivery and 3.16 ± 0.83 kg for multiple, this may possibly due to the effect of the racial purity of the Katahdin, Black Belly and Pelibuey breedes and protein-energy supplementation to their foods represented by soybean and sorghum.

CONCLUSION

It is concluded that the average birth weights of the male and female lambs were heavier for the Creoles compared to the MEVEZUG. The birth weights of single lambs were higher than those of double, triple and quadruple lambings.

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