



Original Article

Evaluation of Prospects Cattle Stallions of the Breed Simmental and Simbrah

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ABSTRACT

For Mexico, the units of agricultural and forestry production is the main land use in the country, covering 57.3% of the country. In this regard, the state of Nuevo Leon, has a surface density which amounts to little more than 5.5 million hectares, representing 86% of the state, with an inventory totaling 386.474 cattle heads, ranking 20, domestic production of beef. Additionally, in Nuevo León per capita consumption of that meat is 37 kg per year. The country's highest, above the national average of 21 kg. Watching this scene and Simmental breeds Simbrah an alternative to meet the needs of the state of meat production, based on the sustainability of natural resources, the nature of these breeds. Therefore, studies are needed to corroborate the ability to adapt to the ecological and economic conditions in the country of these two races promise for domestic producers, especially in northern Mexico. The aim of this study was to evaluate different production traits of economic importance of breeds Simmental and Simbrah under a suitable environment and uniform. Behavioral tests were used to evaluate stallion prospects. The study was performed in 4 months of observation, in Linares, Nuevo León, Mexico. It was making measurements monthly. The variables evaluated were: daily gain for the period (ADG), daily gain for age (GDE), weight adjusted to 365 days, loin eye area, intramuscular fat percentage, back fat, genetic markers (smooth and marbling), body size and scrotal circumference. The results showed that the Simmental breed behaved than the Simbrah for variables: daily weight gain and increase in final weight, no statistically significant differences compared to other variables.

Keywords: Stallions, Simbrah, Simmental, Daily Gain, Scrotal circumference.

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INTRODUCTION

In currently used several practices for genetic improvement, which include the evaluation of prospects to stallions, which have the advantage of assessing and identifying the best stallions at an early age, allowing the improvement of future generations for growth and carcass characteristics. This can be accomplished through selection for characteristics that can

be measured *in vivo* using ultrasound technique, and which are good indicators of the quality of the channel (AOC), intramuscular fat rib eye area (index of marbling) and thickness of back fat (EGD). These tests are of the utmost importance since meat products, especially of cattle currently facing great challenges and opportunities, highlighting the urgent need to increase competitiveness against global competition facing our country.

Advances in the technology of ultrasound to predict the composition and quality of the channel *in vivo*, this technology makes an important tool for the evaluation and improvement of the merit of the breeding beef carcass, without resorting to direct measurements in the channel of related animals, which is costly and takes time for the genetic evaluation of animals.

For Mexico, agricultural and forestry production units is the main land use in the country, covering an area of 112.3 million hectares, which represents the 57.3% of the national territory, according to information from the eighth census agricultural, livestock and forest (Inegi, 2007).

In other side, according to the data of the service of information and statistics agric-food and fisheries of the (Sagarpa, 2002) Mexico has a great diversity of livestock genetic resources, with a total of 45 breeds of cattle, of which 26 are European, 7 Zebu and synthetic 12, product of crosses between European breeds and Zebu.

The State of Nuevo Leon, Mexico, has a livestock area amounting to little more than 5.5 million hectares, 86% of the State area, of which 90% are rangeland, and the remaining 10% of prairies. The livestock inventory in the State of Nuevo Leon amounts to 386,474 cattle.

Today, Nuevo León takes place 20 national beef production. Different breeds of cattle can be adapted to the climatic conditions of Nuevo León, as the Beefmaster, Charoláis, Simmental Simbrah, red Brangus, Santa Gertrudis, Italian (Chianina and Romagnola), Long Horn, Limousin, Braunvieh, Charbray, Braford, among others. The State of Nuevo León has been internationally recognized for the quality of the meat of bovine animals. Additionally, in Nuevo Leon consumption per capita, said meat, is 37 kg a year, according to the Corporation for the Agricultural Development of Nuevo Leon (2008), is the state the highest in the country, which also compares favorably with the national average of 21 kg.

The state of Nuevo Leon, account with a cattle area that amounts to little more than 5.5 million hectares, 86% of the surface state, of which 90% are of rangeland and the remaining 10% of grassland. The livestock inventory in the state of Nuevo León amounts to 386.474 cattle.

According to the Corporation for the Agricultural Development of Nuevo Leon (2008), the predominant production system is extensive rangeland. In terms of induced grassland, there are approximately 540, 000 has induced meadows of temporary, dominated the buffel grass (*Cenchrus ciliaris*). There are close to 20,000 has Prairie with irrigation systems, with grazing African star and bermuda crosses, in addition to about 150,000 ha of fodder such as sorghum, corn, oats, grass, and alfalfa crops.

Genetic Simbraha and Simmental breeds and production of Simmental and Simbrah registered pure Fleckvieh (from registry) races, are highly efficient in activity milk without losing the genetic capacity of calves efficiently produce meat in grazing without additives, special for commercial breeding a true dual-purpose breed, (Mexican Association Simmental Simbrah, 2010). The origin of the simmental breed is in the Simme Valley located in the Berner Oberland, Switzerland. Simmental name derives from its original location. In the German language the word "Thal" or "Tal" means "Valley". Simmental literally means Valley of the Simme. This Valley is located where the river Simme flows in the middle and West of Switzerland where the climate is cold and there is Alpine and sub-alpine vegetation that offers excellent Prairie.

However there is evidence of the breed selection since the 17th century (1600-1630). It was until the year of 1862 that defined the beginning of breeding in purity of race, since

starting the registration of animals in the genealogical book of the race by order of the Government of Switzerland.

Objective

Main objective criticality of this study was the evaluation of the different productive characteristics with economic importance of simmental and simbrah, under an appropriate and uniform environment breeds, which makes that the differences that manifested due to the genetic quality of each individual.

METHODOLOGY

For the realization of the present research were used the tests to assess prospects to stallions, that they have proven to be one more tool to select sires, whose production characteristics are superior to the of his contemporaries. The Simmental-Simbrah Mexican Breeders Association invited all partners to participate by sending their cattle to the "test of evaluation of prospects to stallions" that took place in the facilities of the Center of Research and Agricultural Production at the Universidad Autonoma of Nuevo Leon, located on national road Linares - Ciudad Victoria kilometer 145 in the city of Linares, Nuevo Leon, Mexico.

Reception of the Stallions

There were received on the premises of the Centre of research and production of the January 4th until January 13th 2010.

Upon arrival was a visual, individual and group exam. It weighed for distribution in uniform batches by live weight. Conducted the health management of gastro-enteric worming and against ectoparasites, and vaccinated against IBR, BRSV, PI3, DVB and Clostridial. The same applied vitamin A, D and E. It used a period of adaptation of 19 days (from 4 to 22 January 2010). Food was provided to 16% PC, and they forage grass.

The start date of the assessment took place at 8:00 of January 23th of 2010, taking the initial individual weight of each young bull. Weighing the stallions was diet of food and water for 12 hours prior to the weigh-in, he was also held at hip height and scrotal circumference measurement. According to the results of the weights, adjusted the amount of food that was provided to each placed, adjusting the amount to 3% of the live weight present.

Upon arrival was a visual, individual and group exam.

The weighing was performed every 28 days, being on the following dates:

1st weighing: January 23th 2010

2nd weighing: February 20th, 2010

3rd heavy: March 20th 2010

4^a weighing: April 17th 2010

Weighing final 2010: May 14th 2010

Characteristics or variables that were measured to evaluate the prospects to stallions were:

1. Daily gain for the period (GDP) the formula used was as follows: $GDP = (\text{final weight} - \text{initial weight}) / \text{the days of the Test}$.

2. Daily gain by age (GDE) the formula used was as follows: $GDE = \text{final weight} \div \text{age update}$.

3. Weight adjusted to 365 weaning weight adjusted to age. It is a useful measure, since it combines weaning weight adjusted to weaning with the animal post-weaning growth. Growth post-weaning is mainly determined by the potential of the individual.

Weight Adjusted to 365 days = $(\text{year weight} - \text{weight at weaning}) \div (365 \text{ Days} - \text{Days at weaning}) \times (160 + \text{adjusted weight} \times 205 \text{ days})$.

4. The beef tenderloin area. The measurement loin eye Area carried out with ultrasound equipment brand Aloka 500v, with a linear transducer of 17 cm of 3.5 and a software.

5. Percentage of fat intramuscular.

- 6. Dorsal fat.
- 7. Genetic markers (softness of the meat and marbling).
- 8. Body size

The formula used to calculate the body height for males was as follows:

Ht = height in inch hips.

$$\text{Frame Score} = - 11.548 + 0.4878 (\text{Ht}) - 0.0289 (\text{age in days}) + 0.00001947 (\text{age in days})^2 + 0.0000334 (\text{Ht}) (\text{age in days}).$$

- 9. Scrotal circumference (SC)

The measurement was taken with a tape measure in the wide part of the scrotal pouch, the formula adjustment at 365 days is: Adjusted 365 - diameter SC = current SC [(365 – age in days) x Adjusted Factor age].

It is noteworthy that scrotal circumference is an indicator of the fertility of the bull and will have a positive effect on the reproductive behavior of the daughters, such as early puberty. This is also considerable evidence that the measurement of the scrotal circumference in a bull between 1 and 2 years old has a heritability of moderate to high, (Mexican Association Simmental Simbrah, 2010).

Nutrition

The food ration was provided on the basis of a balanced diet containing 60 to 70% of available nutrients in general terms total (2.2 to 2.6 Mcal/Kg DM) and 16% crude protein. The ingredients for this ration were: sorghum grain, soybeans, ground bale of forage, molasses and pre flour blend of vitamins and minerals.

Climate

In the municipality of Linares, Nuevo Leon, Mexico, it has a semi-hot climate sub-humid, registering an average annual temperature 21.4 °C, presenting extreme temperatures of 42 °C in summer and - 2 °C in winter. The increased storm rainfall is typically recorded in the month of September, which oscillates between 170 and 180 mm, and the minimum in the months of January and December, between 15 and 20 mm. It is worth mentioning that the leaflets to stallions were evaluated under weather conditions that are presented in Table 1, by which, should be taken into account in the subsequent performance of the prospect:

Table 1: Rainfall and temperature presented during the evaluation of prospects to pedigree Simmental and Simbrah, from January to May 2010

Month	Rainfall	Accumulated rainfall		Temperature (°C)		
	(mm)	(mm)	Inch	maximum	minimum	Average
January	30.2	30.2	1.2	25	2	13.5
February	35.5	65.7	2.6	28	2	15.0
March	4.0	69.7	2.8	34	5	19.5
April	190.5	260.2	10.4	35	10	22.5
May	7.5	267.7	10.7	36	14.5	25.3

Source: Weather Stations of Centro de Investigación y Producción Agropecuaria, UANL y Facultad de Ciencias Forestales, UANL

RESULTS AND DISCUSSION

The statistical analysis showed a high statistical difference between the total profits made by each of the two tested races and also showed highly significant statistical differences in the values of average daily gain for the two races (Table 2). Not found statistical differences with regard to the average profit of the two races.

The duration time of a test to get accurate data regarding the consumption of food in this study was 56 to 70 days. The differences between the races in the response of the components

of variance to increase the duration of the tests are less. It can a slight trend occur in the Simmental bulls that they require durability tests than other races because some traits, but these differences are not consistent.

Table 2: Results of the statistical analysis of the variables final weight gain and daily gain in weight, for the two breeds of cattle tested

Variable	SS Effect	Df	MS Effect	CS Error	Df	MS Error	F	p
Final gain	4835	1	4835.4	16765	30	559	8.65	0.006**
Daily gain	0.40	1	0.3995	1.433	30	0.05	8.36	0.007**

The foregoing is supported with the found by Archer and Bergh (2000); Kemp (1990) and Brown *et al.*, (1991), who recommend duration for testing measurement of the rate of growth in the literature includes 112 days, 84 days and 70 days. The studies that 112 days recommended usually based its conclusions on the basis of phenotypic correlations with evidence of 140 days and they do not consider problems with auto correlation data, while those that recommend shorter tests (84-70 days) were based on a variation of components. In Figure 1, graphically shows the rise in the increase in final weight for the Simmental Simbrah race about race, ($p = 0.006$), by which it can be said that the Simmental breed presents a better value of gain at the end of the test, even and when handling costs were the same for the two races in the conditions in which the test was performed.

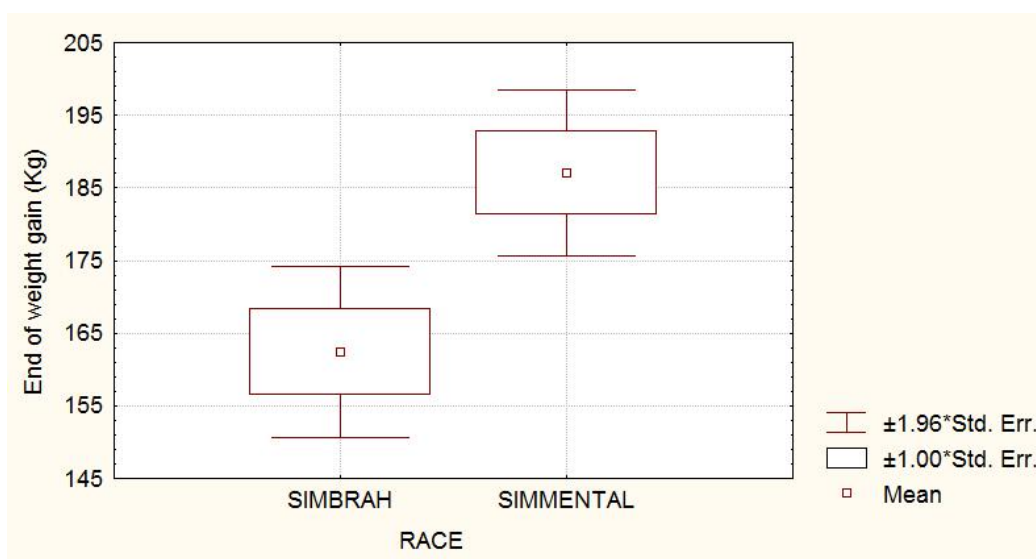


Figure 1: Behavior of the increase in final weight observed in the races tested

With regard to the daily gain for each race, you can see, in Figure 2, the same behavior to be greater in the Simmental breed, even when it is assumed that the race Simmbrah, was created from the first round with the objective to better tolerate extreme environmental conditions that are presented in the northeast of Mexico, where the study was conducted, the genetic contribution of the race Cebu, does not become even as, less greater than the Simmental breed in terms of increased daily weight.

What has been said above you can compare with what was found by Charolais and Limousin, (Renand *et al.*, 1998), with cattle estimated genetic correlation that exists in the evaluations of stallions of the central station, using bulls that were subsequently tested, and studied its progeny, finding that the select by growth and residual feed rate (NFI), resulted in a significant increase in the ability of the muscle growth in the offspring in response to the selection of the Charolais breed.

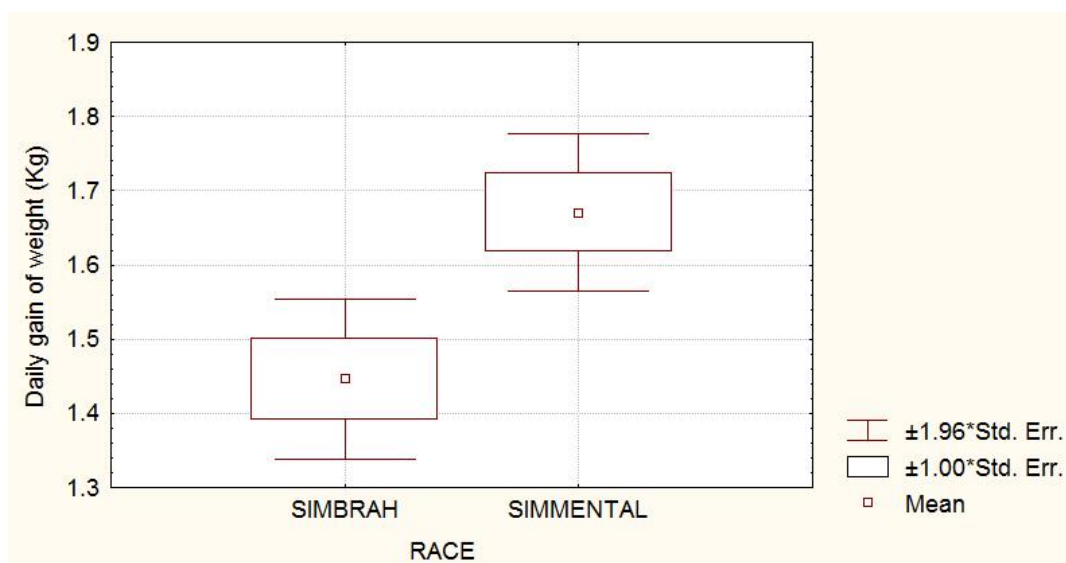


Figura 2: Comportamiento de los valores medios de la variable ganancia diaria para las dos razas probadas

With regard to the daily gain has to be in the state of Sonora, Mexico was conducted an assessment of prospects to stallions in confinement in poultry, with a duration 140 days, by providing them with a complete diet, the races were Charolais, Indobrasil and Simmental taking a daily gain of 1.488, 1.183 and 1.457 g, respectively (López, 1981), whereas in the present study, the Simmental breed presented a daily gain superior of the order of 1.680 g.

Hernández *et al.*, (1995), they mentioned that in the selection of bullocks for stallions should be considered important characteristics such as: the weight, the daily gain and the scrotal circumference, as well as other phenotypic characteristics, in order to achieve the selection to be efficient and obtain a higher genetic progress. Therefore, among the most important are: the daily gain of weight, height, scrotal circumference, characteristics of body composition measures with ultrasound and the fertility test, mainly (Rodríguez-Almeida, 1997).

No statistically significant differences were found between the two races with a level of $p > 0.05$ in the following variables:

Weight adjusted to 365 days, Area of the loin eye, Percentage of intramuscular fat, Fat, Genetic markers (softness and meat type marbled with fat “marmoleo”), Body size and scrotal circumference.

The foregoing tells us that these characteristics under the conditions in which the study was conducted, are features that both breeds have alike.

If it's looking for a higher increase in weight or final journal, then it should consider the Simmental breed as the most appropriate. The foregoing indicates that at least, with regard to these characteristics, continues to play the race Simbrah, both as the Simmental, what not discredited the formation of the race Simbrah, at least with respect to these variables and in the favorable conditions under which the present study was carried out.

Quite possibly, in most adverse conditions or even extreme weather and power, could be exploited the characteristics that contribute to the race Simbrah, race Cebu.

Johnson *et al.*, (1995) mentioned in a study, that the bulls of pure races as Hereford and Simmental ($n = 120$), were evaluated their reproductive parameters. Four diets were used, all the same in composition with the exception of the dietary fiber, were given during the test of growth behavior, the diet had no direct effect (FQO. 10) in any of the reproductive variables examined.

Of the 117 bulls to be had for the evaluation of their good play status, 75% were classified as satisfactory potential players, the 24% as "questionable" potential player and 1% as unsatisfactory potential players.

CONCLUSIONS

When assessing the various productive characteristics with economic importance of animals of the Simmental breed and Simbrah, under a uniform environment, which makes the differences that emerge due to the genetic quality of each individual, it was found that after 4 months of the test, the Simmental breed behaved than the Simbrah, respect to the variables: Increase in daily weight and increase in final weight.

Likewise, it was noted that there were no statistically significant differences between the two races (Simmental and Simbrah) with respect to the variables weight adjusted to 365 days, Area of the loin eye, percentage of intramuscular fat, fat, genetic markers (softness and meat type marbled with fat "marmoleo"), body size and scrotal circumference.

It is believed that at least, with regard to these characteristics, continues to play the race Simbrah, both as the Simmental, with the objectives for which it was created the first time, so not discredited the formation of the race Simbrah, at least with regard to the latter variables mentioned in the favorable conditions under which the present study was carried out. Quite possibly, in most adverse conditions or even extreme weather and power, could be exploited the features that the race brings to the Cebu race Simbrah.

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