

ACTUALITY AND FUTURE OF A BREEDING PROGRAM IN RETINTO BEEF CATTLE

ACTUALIDAD Y FUTURO DE UN PROGRAMA DE MEJORA EN EL GANADO VACUNO DE RAZA RETINTA

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Palabras clave adicionales

Mejora Genética. Vacuno Retinto.

SUMMARY

We describe the present process of genetic improvement in Retinto cattle breed and the investigations supporting the selection program. The effects of different environmental factors have been analyzed. We have obtained the coefficients of correction for the significant effects for the repeatability of the variables and for the inbreeding coefficients. Also improvement plans are proposed.

RESUMEN

Se describen el proceso de mejora genética en ganado vacuno Retinto y los trabajos de investigación para proporcionar bases científicas al programa de selección. Se han analizado los efectos de distintas variables ambientales y obtenido coeficientes de corrección para los efectos significativos, la repetibilidades de los distintas variables y los coeficientes de consanguinidad para las poblaciones. Así mismo se proponen acciones de mejora para el futuro.

INTRODUCTION

Four years ago a breeding program with Retinto Beef Cattle has started to be developed in Cádiz province. This breed is the main autochthonous beef breed of the SW of Spain: the census account for the 5.6 % of national cattle. These animals are exploited on a extensive system, using them mainly like maternal breed to cross with other commercial breeds like Charolais and Limousin, taking advantage of its high maternal ability and the rentability of the crosses.

The calves that we are obtaining from the young sires controlled in the breeding program present very similar growing records to the commercial breeds on the same handling conditions. (Additional breed's information can be found on Serrano *et al.* 1992).

A very remarkable quality of this breed is its plasticity. Comparing data and descriptions from some years ago

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(Aparicio, 1970; Bellas Rivera, 1968; Jordano *et al.* 1980), with those of controlled herds, the meat production has increased; the shape, before (1960s) more adequate for a traction animal with a very developed first part of body, is today with a excellent beef conformation.

This transformation is due to control of animals and supplementation on very extreme summer or winter conditions. Also, livestock fairs have propagate the very strong empiric selection of sires, that was made for several well known breeders.

This fact and the experience of scientific team of Badajoz move the following institutions to work together to attend a breeding program:

The Experimental Agrarian Research Center of the Diputation of Cádiz, who organize and supervise one reference sires scheme with ten herds involved in the program.

The Department of Genetic of Córdoba Veterinary Faculty were the data are computerized and processed, giving back information to breeders.

The Institute of Animal Breeding and Quantitative Genetics of Hannover, witch has provided the programs to estimate genetic parameters and breeding values.

The activities developed from 1988 to 1992 we can resume on the following:

1.-The Experimental Agrarian Research Center of the Diputation of Cádiz has organized a reference sires scheme on different herds (9 on 1988, 10 on 1991). 10 sires, old and young bulls, are used on A.I. together with natural mating. Very strict control have been made on the collaborating farms: mating and birth dates, identifi-

cation of the parents and the calves; reproductive data and three weights of the calves until weaning (inclusive) are some of the data reported.

2.- The elaboration of a data bank with information of twenty herds, ten of Cádiz and ten of Extremadura. At this moment there are data of 102 sires, ten of them used on A.I., and 1200 dams with information of its productive and reproductive performances and the growing records of their progenies. For sires and dams from Cádiz is also registered the breeding value and the inbreeding coefficient. These estimations are constantly reviewed as far as the collection of data increase.

3.- The current inbreeding has been calculated for the Cádiz population (59 sires, 10 on A.I. and 680 dams). The ancestral information was provided by the Retinto Breeders Association, and now is computerized with the whole information. To calculate these coefficients we have used one program based on the recourssive algorithm of Hudson *et al.* (1982).

4.-The productive traits are very affected by the very strong environmental changes among years, seasons etc., because of the special extensive handling conditions and, also, changes in cow physiology, as calving number. For the growth traits, it has been necessary to determinate the significative fixed environmental factors and the amount of variance due to them.

5.- As far as we hold more data, we are using different models and more complex statistical methods with the collaboration of the Institute of Animal Breeding and Quantitative Genetics of the Veterinary University of Han-

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nover (Germany). Until the moment, the available information only allows us to estimate the genetic parameters and breeding values using Sire-Dam lineal models and in some cases the model Dam-Father of the Dam. To estimate the (co)variance components and then the breeding values, we have used the method REML with programs written by Bollmeier *et al.* (1991) and also S.A.S (v.. 0.6) VARCOMP procedures.

6.-The Department of Genetic of the Veterinary Faculty has elaborated annual reports to the breeders with the results obtained on the scientific work with a practice application. The calves records are provided corrected for the significative fixed effects to make these data useful to the breeder in order to evaluate their products

7.- These Institutions together with the Retinto Breeders Association have elaborated the National Selection Program for the Retinto Breed approved by the Ministry of Agriculture on February 1992.

MAIN RESULTS OBTAINED

1.- In order to tipify the field weights we have estimated the growth curve until weaning. The best fitness was founded with the lineal regression $\text{weight} = 39.043 + 0.909 \times \text{Age}$ (Molina *et al.* 1992), with $R^2=90.07$.

2.- All the fixed effects considered on the mixed lineal model, were significant in all the analyzed weight variables. Production is very influenced by the environmental factors.

3.- Calves from the second to sixth

calving give the highest values for each growth trait.

4.- LSQ constants have been calculated for every factor, in order to correct data for the significant effects.

5.- The dam repeatability for weights of successive offsprings, was estimated with two methods, as intraclass correlation and as regression coefficient. The mean values founded for the different variables are similar to those reported for other beef cattle breeds. The second over the first control regression method can avoid the bias of the dam's selection.

6.- Inbreeding was discovered in the 17,7% of the cows; 5,8% of them had an inbreeding coefficient of 25%. The rate of inbreeding per generation is very higher than other beef cattle breeds (Bollmeier *et al.*, 1991). Because of the manner in which the bulls are used, also a considerable non current inbreeding has to be expected.

FUTURE

We have the following goals to reach in the next future:

- To continue with the actual breeding program on growth traits in order to obtain a population with no so big differences of records within herd as we find at the moment.

- Organize the necessary structure to develop a selection scheme based on the meat quality. There is not a standard quality and sometime the meat is very hard. It is necessary to determinate which are the qualitative and quantitative characteristics of the Retinto meat, and select for the most convenient.

- The inference of the genetic parameters have to be improved. On this cattle the influence of the maternal effects is very big on the growth traits and we have to estimate its amount to obtain a good estimation of the parameters.

REFERENCES

Aparicio, J.B. 1970. Aspectos etnológicos del ganado vacuno Retinto. *La Mesta* 15: 946-947.

Bellas Rivera, 1968. El Retinto Andaluz y sus mestizajes. *Estudios* 6, 33 :78. Ministerio de Agricultura. Instituto de Colonización.

Bollmeier, S., M. Mayer, D. Simon. 1991. Entwicklung der genetischen Struktur beim württembergisch Braunvieh. *Züchtungskunde* 63:1.

Hudson, G.F.S., R.L. Quaas, and L.D. Van Vleck. 1982. Computer algorithm for the recursive method of calculating large numerator relationship matrices. *J. Dairy Sci.* 65: 2018.

Jordano, D. et al. 1980. Comportamiento de la

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raza Retinta en la producción de carne. Servicio de Publicaciones Agrarias del M.A.P.A. Madrid.

Molina, A., M.I. Serrano, A. Burgos, et al. 1992. Estimación de la curva de crecimiento en vacuno retinto: Aspectos prácticos para la tipificación de pesos. *Arch. Zootec.* 41(154):543-548.

Serrano, I., A. Burgos, A. Molina, J.M. Jiménez, F. Salado, M. Mayer, A. Rodero. 1992. Productive characterisation of the Retinto beef cattle. W.M.D.A.B.D.A., Annual Meeting. Córdoba. España.