

EFFECT OF GENETIC LINE ON CARCASS FEATURES IN NEW ZEALAND vs. CALIFORNIA RABBITS

***¹SÁNCHEZ A. PEDRO, ²FLORES P. CARLOS S, ³MERCADO M. CRISÓFORO,
¹MORA V. JOSÉ MAURO, ⁴CORTES A. JOSÉ L.**

1.-Facultad de Medicina Veterinaria y Zootecnia, Bioterio del Hospital Veterinario para pequeñas especies, Universidad Autónoma del Estado de México- UAEMex. México.

2.-Facultad de Estudios Superiores Cuautitlán, Departamento Ciencias Pecuarias, UNAM. México.

3.-Facultad de Estudios Superiores Cuautitlán, Departamento Ciencias Pecuarias, Unidad de Aislamiento y Bioterio. UNAM. México.

4.-Facultad de Medicina Veterinaria y Zootecnia. UNAM., México.

*Corresponding author: pedrosanchezaparicio0@gmail.com

ABSTRACT

Probably the rabbit is the domestic mammal has the highest production potential for the supplying of meat, being this lean and with a high percentage of polyunsaturated oils. The composition of meat varies according to age of the animal and the feed system. However, it has not evaluated the effect of breed on the morphometry and carcass yield in adult rabbits. For that reason, the purpose of this study was to evaluate the effect of breed on morphometry, carcass yield and meat-fat-bone ratio in New Zealand vs. California rabbits. The experiment was performed in the meat workshop of Center Teaching Faculty of Cuautitlán, UNAM. 30 rabbits of New Zealand breed and 30 of the California breed were used, the rabbits were sacrificed upon reaching 77 days. For the experiment was taken slaughter weight, hot carcass weight and cold carcass weight of the rabbits of the two respective breeds: 15-18 h post-slaughter and refrigerated at 2 ± 2 °C. The rabbits were desensitized, disjointed cervically and then sacrificed by exsanguination according to NOM-033-ZOO-1995. After slaughters the rabbits were deboned manually, weighing meat bone and fat and carcasses were evaluated separately, and the values were recorded. Findings from the experiment indicate that the rabbits of the New Zealand line have better carcass weight hot and cold when compared with the California breed.

389



UAEM Universidad Autónoma
del Estado de México

V CONGRESO AMERICANO DE CUNICULTURA, MÉXICO 2014

Facultad de Medicina Veterinaria y Zootecnia, Asociación Científica Mundial de Cunicultura – Rama Americana
Secretaría de Desarrollo Agropecuario del Gobierno del Estado de México, Secretaría de Agricultura, Ganadería, Desarrollo Rural,
Pesca y Alimentación, Consejo Mexiquense de Ciencia y Tecnología

The commercial performance in this genetic line also happens to be greater, with an interesting feature that in the thoracic region is the site where most meat is deposited.

Key words: Morphometrics, Performance, Carcass, Rabbits.



390



Congreso Americano
de Cunicultura
2014



SAGARPA
SECRETARÍA DE AGRICULTURA,
GANADERÍA, DESARROLLO RURAL,
PESCA Y ALIMENTACIÓN



COMECYT
CONSEJO MEXIQUENSE DE CIENCIA Y TECNOLOGÍA

V CONGRESO AMERICANO DE CUNICULTURA, MÉXICO 2014

Facultad de Medicina Veterinaria y Zootecnia, Asociación Científica Mundial de Cunicultura – Rama Americana
Secretaría de Desarrollo Agropecuario del Gobierno del Estado de México, Secretaría de Agricultura, Ganadería, Desarrollo Rural,
Pesca y Alimentación, Consejo Mexiquense de Ciencia y Tecnología

INTRODUCTION

Probably the rabbit is the domestic mammal with higher potential for self-sufficiency in meat, this being lean and with a high percentage of polyunsaturated oils (Shimada, 2003). The composition of meat varies with the age of the animal and the feeding system (Sandford, 1988). Despite these favorable characteristics, the popularity of the species is very low especially in developing countries that have a high percentage of rural population. In Latin America there are some commercial farms producing moderate volumes of meat and skins. In the United States breeding stock produced to be designed as companion pet while in backyard waste are utilized as fertilizer for planting fields (Shimada, 2003).

Due to the characteristics of its production, raising rabbits could be the answer to the problems of hunger, malnutrition and rural poverty in developing countries because it is possible to obtain more than 50 kg of meat in a year with only one pup rabbit. Habits in consumption of rabbit meat are still rising in countries where it is not traditionally consumed, due, among other factors, the demand for meat with improved nutritional characteristics, this may represent potentially the opportunity to increase consumption this type of meat as a healthy food (Ramírez, 2004).

In Mexico it is common to market entire rabbit carcass moreover rabbit meat is not marketed in pieces so it has not arisen interest in assessing the various parts of the carcass (Flores-Peinado, 2009). The carcass assessment can be obtained by the chemical composition, for classification. The classification of the carcass determines the productive efficiency of rabbits during the growth phase and its correlation with environmental factors to determine their influence on the performance of the various parts of the carcass (Barrón y Zamora 2004). The objective was to assess the effect of race on the morphometry, carcass yield and meat-fat-bone in rabbits slaughtered at 77 days of age (New Zeland vs California).



UAEM Universidad Autónoma
del Estado de México

V CONGRESO AMERICANO DE CUNICULTURA, MÉXICO 2014

Facultad de Medicina Veterinaria y Zootecnia, Asociación Científica Mundial de Cunicultura – Rama Americana
Secretaría de Desarrollo Agropecuario del Gobierno del Estado de México, Secretaría de Agricultura, Ganadería, Desarrollo Rural,
Pesca y Alimentación, Consejo Mexiquense de Ciencia y Tecnología

MATERIAL AND METHODS

The present study was performed in rabbits in the Meat Workshop module located in the Agricultural Education Centre School of Advanced Studies Cuautitlán (FES-C, field 4) in the State of Mexico.

Number of animals and location

The cunicultura module had 40 breeding does, 20 of the New Zealand line and 20 of the California line. All females were gestated and pups to their growth rate was performed 8 days after the birth. at 30 days of age, a total of 80 rabbits were separated from their mothers. the rabbits were brought to feedlots area, where given food type fattening. Throughout the experiment, animals were kept in cages ladder style California.

With the aim to differentiate immediately between 2 genetic lines, 2 colors of boxes and paper labels were used. The rabbits of both strains were fed with the same food and similar amounts. During fattening, death of 20 animals was reported, 10 New Zealand genetic line and 5 of the California line, causes of deaths were parasitic, otitis and cannibalism. 5 more animals were excluded from the study for to have the same number of animals in the study. At the end of 77 days of age, the slaughter of 60 animals was performed (30 Nueva Zelanda, 30 californiana).

Procedure

During the experimental phase control birth dates, birth, end the growth stage was performed sacrifice, trying to bring a synchrony during the execution of the experiment to the fattening and slaughter dates fall in the same season exist and prevent the least amount of factors that could affect the results of the project.

The animals under study were brought to the slaughter room. Initially, the live weight of pre-slaughter animal was assess in a digital scale (Tor Rey tipo PCL, México, capacity of 20 kg). Subsequently the animals were scored into the left ear with the help of a permanent marker and numbering was consecutive from 1 to 60, the numbers 1 to 30 correspond to the race of New Zealand and 31 to 60 correspond to California breed.

392



Congreso Americano
de Cunicultura
2014



SAGARPA
SECRETARÍA DE AGRICULTURA,
GANADERÍA, DESARROLLO RURAL,
PESCA Y ALIMENTACIÓN



COMECYT
CONSEJO MEXIQUENSE DE CIENCIA Y TECNOLOGÍA

V CONGRESO AMERICANO DE CUNICULTURA, MÉXICO 2014

Facultad de Medicina Veterinaria y Zootecnia, Asociación Científica Mundial de Cunicultura – Rama Americana
Secretaría de Desarrollo Agropecuario del Gobierno del Estado de México, Secretaría de Agricultura, Ganadería, Desarrollo Rural,
Pesca y Alimentación, Consejo Mexiquense de Ciencia y Tecnología

Slaughter

The rabbits were desensitized by the method of the dismantling of cervical vertebrae and subsequently killed by a process of exsanguination in accordance with the provisions of the Official Mexican Norm (NOM-033-ZOO-1995) which refers to the domestic animals Slaughter.

The 4 limbs were removed, skinning and gutting was done, leaving only carcass attached to the kidneys and liver. The hot carcass weight was obtained at that time and using the same digital scale. Moments later a plastic plate was placed at each of the carcass at the level of the tibia and fibula allowing the identification of breed, kept order in the slaughter line.

Morphometry of the carcass

Carcasses were washed, placed approximately 10 minutes at room temperature and mobilized to a cooling chamber with controlled temperature $\pm 2^{\circ} \text{C}$. The carcasses were placed in stainless steel tables and covered with plastic. During 24 hours, the carcasses were brought to a cold room under the same conditions of temperature to obtain the weight of the carcass in cold and morphometric measures between which they emphasize the length of the channel (LC = anterior border of the isqueo first rib to the symphysis), chest depth (PT = the lower part of the sternum to the middle of the back) and roundness of the right ham (RJ = determined at the widest part of the leg or height of the femoral-tibial-patellar joint). All morphometric mediated were performed with the help of a measuring tape and plastic vernier, according to the provisions of the methodology previously described by Becerril (2004).

Relationship Fat-Meat-Bone

The separation of the head, liver and kidney was performed, then its weight was obtained individually. The carcass was cut in 3 fractions the first region included the neck, forelegs and rib 1 to 8, the second fraction only included the trunk, and the third fraction hindlimbs and pelvic region.

V CONGRESO AMERICANO DE CUNICULTURA, MÉXICO 2014

Facultad de Medicina Veterinaria y Zootecnia, Asociación Científica Mundial de Cunicultura – Rama Americana
Secretaría de Desarrollo Agropecuario del Gobierno del Estado de México, Secretaría de Agricultura, Ganadería, Desarrollo Rural,
Pesca y Alimentación, Consejo Mexiquense de Ciencia y Tecnología

RESULTS

The results indicate that the weight of the slaughtering G1 and G2 showed no statistically significant differences. In this sense, after performing the slaughter process, it was identified that the hot carcass weight was statistically higher in New Zealand line rabbits (G1) on the California line rabbits (G2). The same trend was observed when the weight of cold carcass was obtained. During the cooling process of the channels which arises immediately after the slaughter process, the study has shown that California line rabbits lose more weight, same to be related to the loss of water by oreo. It is appreciated that the rabbits of the New Zealand line have a higher carcass yield (P 0.0226) compared with the California Online rabbits.

DISCUSSION

For weight of hot carcass it was observed that rabbits of New Zealand breed was higher than in the California breed, Dalle describe (2002) that one of the principles factors affecting carcass weight and quality of the carne rabbit is the adult weight which is very important in the growth rate, earlier maturity and body composition of rabbit. This explains the higher carcass weight from the New Zealand because this breed has the highest adult weight. And which states that the carcass weight (CW) was different between genotypes, results that are similar to the effect of genotype observed by Ouyed and Brun (2008) they reported CW similar between pure New Zealand rabbits and genotypes ZL-F1 and NZ-CH-CL CN 1235.2G 1242.7 And 1207.6g respectively. Larzul *et al* (2005) found that the genetic group was important to determine the CW in rabbits. For the weight of the cold channel effect observed differences between genotype, New Zealand again between genotypes were higher than those of the genotype California. The difference in cooling rate between genotypes losses probably due to differences in the proportion of type I and type II fibers between breeds of rabbits, the increase in the percentage of fibers II has been associated with changes in characteristics organoleptics flesh as best conservcion time, lighter meat color, less water retencion less tenderness, among others (Arnal and Lopez 2001).

V CONGRESO AMERICANO DE CUNICULTURA, MÉXICO 2014

Facultad de Medicina Veterinaria y Zootecnia, Asociación Científica Mundial de Cunicultura – Rama Americana
Secretaría de Desarrollo Agropecuario del Gobierno del Estado de México, Secretaría de Agricultura, Ganadería, Desarrollo Rural,
Pesca y Alimentación, Consejo Mexiquense de Ciencia y Tecnología

Greater efficiency in the New Zealand line (P 0.0226) compared to californa was observed. Suarez (2009) observed difference due to genotype and age, results that are similar to those observed by Evans et al (1997) who found differences in carcass yield between genetic groups of two lines of rabbits. Some authors propose a classification in which the carcass with a yield of 55% are considered of good quality, which derive more than 60%, are of excellent quality (Ortiz 2001), so that under these criteria carcasses analyzed in this study would be within the high range selection as similar yields were obtained.

As for the morphometric cracteristicas was observed that the New Zealand breed has a greater depth of chest this because in their phenotypic selection reflected by the external formation earliness of development, developing a good production of meat body shape, short neck , chest deep and long, well developed back, muscular, glossy hair and a full sexual development. In short, present an adequate standard morphological (Roca, 2008).

395

REFERENCES

- Shimada, M. A. 2003. *Nutrición Animal*. México. Primera Edición. Editorial Trillas. 267 p.
- Sandford, J. C. 1988. *El Conejo Doméstico: Biología y Producción*. Zaragoza: Primera Edición. Editorial Acriba. pp. 203.
- Ramírez, T. J. A. 2004. Tesis Doctoral: Características bioquímicas del músculo, calidad de la carne y grasa de los conejos seleccionados por velocidad de crecimiento. España .Facultad de Veterinaria. Universidad Autónoma de Barcelona.
- Flores, Peinado. Salvador. 2009. Tesis de Maestría: Efecto del periodo de ayuno y método de aturdimiento sobre el bienestar y características físico-químicas de la carne de conejo. México. FES-C.
- Barrón, G. M., Zamora. M. 2004. Características de la canal de tres razas de conejos Revista FES-C. *Divulgación científica multidisciplinaria*. 4(11): 7-12.
- Becerril, H. M. 2004. Tesis de Maestría: Crecimiento y calidad de la canal de cerdos Pelón Mexicano y York-Landrace en confinamiento y pastoreo. FMVZ-UNAM.





UAEM Universidad Autónoma
del Estado de México

V CONGRESO AMERICANO DE CUNICULTURA, MÉXICO 2014

Facultad de Medicina Veterinaria y Zootecnia, Asociación Científica Mundial de Cunicultura – Rama Americana
Secretaría de Desarrollo Agropecuario del Gobierno del Estado de México, Secretaría de Agricultura, Ganadería, Desarrollo Rural,
Pesca y Alimentación, Consejo Mexiquense de Ciencia y Tecnología

- Dalle, Z. A. 2002. Perception of rabbit meat quality and major factors influencing the rabbit carcass and meat quality. *Livest. Prod. Sci.* 75: 11-32.
- Ouyed A., and Brun J.M..2008. Comparison of growth performances and carcass qualities of crossbred rabbits from four sire lines in quebec. *Proceedings of 9^a World Rabbit Congreso.* June 10-13 Verona, Italy.
- Larzul, C. Y. Rochambeau, H. de 2005. Seleccíon for residual feed consumption in the rabbit. *Livestock Productio Science*, 95: 67-72
- Arnal, C. y López, M. 2001. Efecto de la raza y de la edad sobre el porcentaje de fibras musculares en el Conejo: resultados preliminares IX jornadas sobre producción animal. ITEA. Vol. Extra No. 22 Tomo II 685-687.
- Suarez, J. R. 2009. Tesis Doctoral. Calidad de los Alimentos Comerciales y Genotipos de Conejo para la producción de Carne en México. Mexico Campus Montecillo. Colegio de Postgraduados.
- Espinoza, F.F., Espnoza, V.J., Pro, M.A., Becerril, P.C. y Torres, H.G. 1997. Postweaning performance of two New Zelanda Whuite lines an their reciprocal crosses fed a high forage diet. *World Rabbit Science.* 1997 Vol. 5 (4) 149-154.
- Ortiz-Hernández, S. A., y Rubio-Lozano, M.S. 2001 Effect of reed and sex on rabbit carcass yield and meat quality. *World Rabbit Science*, 9 (2), 51-56.
- ROCA, T. 2008 Razas de conejos (en línea) <http://www.conejos-info.com/articulos/razas-de-conejos>.

396



Congreso Americano
de Cunicultura
2014



SAGARPA
SECRETARÍA DE AGRICULTURA,
GANADERÍA, DESARROLLO RURAL,
PESCA Y ALIMENTACIÓN



COMECYT
CONSEJO MEXIQUENSE DE CIENCIA Y TECNOLOGÍA