

Scientific paper

## Abstract

The experiment was conducted on the premises of the Center of Animal Production (NUPRAN), Department of Agricultural and Environmental Sciences of the Midwestern State University, in Guarapuava - PR. It was used in this experiment 32 young bulls, from the Charolais breed, coming from the same herd, with an average age of 12 months and average weight of 323 kg with a standard deviation of 5 kg. The objective of the study was the evaluation of carcass characteristics and the not integrated carcass components of steers finished in feedlot, using different diets: T1- 100% concentrate diet (80% of the whole maize grain + 20% protein core) *ad libitum* with homeopathy (100g day<sup>-1</sup> of CONVERT H®); T2 - 100% concentrate diet (80% of the whole maize grain + 20% protein core) *ad libitum* without homeopathy; T3 - 48% concentrate diet: maize silage *ad libitum* + concentrate (5.5 kg animal day<sup>-1</sup>) with homeopathy (100g day<sup>-1</sup> of CONVERT H®); T4 - 48% concentrate diet: maize silage *ad libitum* + concentrate (5.5 kg animal day<sup>-1</sup>) without homeopathy. In a general manner, the inclusion of 100 g day<sup>-1</sup> of CONVERT H®, did not present influences in the carcass characteristics and in its non-carcass components. The 100% concentrate diet promoted physiological performance changes on the spleen and heart of young bulls.

**Keywords:** Homeopathy, Levels of concentrate, Fat thickness, Carcass yield.

## The homeopathy on carcasses of feedlot steers, fed with diets containing 48% or 100% of concentrate

Fabiano Marafon<sup>1</sup>

Mikael Neumann<sup>2</sup>

Danúbia Nogueira Figueira<sup>3</sup>

Cecília Aparecida Spada<sup>4</sup>

Gilmar Adílio Salmoria<sup>5</sup>

## A homeopatia nas carcaças de novilhos confinados, alimentados com dietas contendo 48% ou 100% de concentrado

### Resumo

O experimento se desenvolveu nas instalações do Núcleo de Produção Animal (Nupran) do Setor de Ciências Agrárias e Ambientais da UNICENTRO, em Guarapuava, PR. Utilizou-se 32 novilhos inteiros, raça Charolês, provenientes de mesmo rebanho, com idade média de 12 meses, peso vivo médio inicial de 323 kg com desvio padrão de 5 kg. O objetivo do trabalho foi a avaliação das características de carcaça e dos componentes não integrantes de carcaça de novilhos terminados em confinamento, utilizando diferentes dietas: T1 - dieta 100% concentrado (80% milho grão inteiro + 20% núcleo protéico) *ad libitum* com homeopatia (100g dia<sup>-1</sup> de CONVERT H®); T2 - dieta 100% concentrado (80% milho grão inteiro + 20% núcleo protéico) *ad libitum* sem homeopatia; T3 - dieta 48% concentrado: silagem de milho *ad libitum* + concentrado (5,5 kg animal<sup>-1</sup> dia<sup>-1</sup>) com homeopatia (100g dia<sup>-1</sup> de CONVERT H®); T4 - dieta 48% concentrado: silagem de milho *ad libitum* + concentrado (5,5 kg animal<sup>-1</sup> dia<sup>-1</sup>) sem homeopatia. De maneira geral, a inclusão de 100 g dia<sup>-1</sup> de CONVERT H® não apresentou influencia nas características da carcaça e de seus componentes não integrantes. A dieta 100% concentrado promoveu alterações de atuação fisiológica no baço e no coração.

**Palavras-chave:** Componentes não-carcaça, Níveis de concentrado, Espessura de gordura, Rendimento de carcaça.

Received in: 06/03/2012

Accepted for publication: 13/11/2012

1 Veterinary Doctor, Master's Programme of Postgraduate in Agronomy UNICENTRO, Guarapuava-Pr, Brazil. E-mail: fabiano\_marafon@hotmail.com

2 Agronomist Engineer Dr., Prof. of the Course Masters in Agronomy, Universidade Estadual do Centro Oeste - UNICENTRO, Campus CEDETEG Guarapuava-Pr, Brasil. CEP: 85.040-080 E-mail: mikaelneumann@hotmail.com

3 Undergraduate of the Veterinary Medicine Course at UNICENTRO, Guarapuava-Pr, Brazil.

4 Undergraduate of the Veterinary Medicine Course at UNICENTRO, Guarapuava-Pr, Brazil.

5 Zootechnician, Sales Supervisor of the company Real H, Campo Grande - MS, Brazil.

## La homeopatía en las canales de novillos confinados, alimentados con dietas con 48% o 100% de concentrado

### Resumen

El experimento se desarrolló en las instalaciones del Centro de Producción Animal (Nupran) Sector de Ciencias Agrarias y Ambientales de Unicentro en Guarapuava, PR. Se utilizó 32 novillos enteros, raza Charollesa de la misma manada, con edad promedio de 12 meses, peso vivo promedio de 323 kg, con una desviación estándar de 5 kg. El objetivo de este estudio fue la evaluación de características de la canal y de componentes no integrantes de la canal de novillos terminados en confinamiento, utilizando distintas dietas: T1 - 100% concentrado (80% grano entero de maíz + 20% de núcleo proteico) ad libitum con la homeopatía (100g día<sup>-1</sup> CONVERT H ®), T2 - dieta 100% de concentrado 80% grano entero de maíz + 20% de núcleo proteico) ad libitum sin homeopatía, T3 - dieta 48% de concentrado: forraje de maíz ad libitum + concentrado (5, 5 kg animal<sup>-1</sup> día<sup>-1</sup>) con la homeopatía (100g día<sup>-1</sup> CONVERT H ®), T4 - dieta 48% de concentrado: forraje de maíz ad libitum + concentrado (5,5 kg animal<sup>-1</sup> día<sup>-1</sup>) sin la homeopatía. En general, la inclusión de 100 g día<sup>-1</sup> CONVERT H ® no mostró influencia sobre las características de la canal y de sus componentes no integrantes. La dieta de 100% concentrado ha promovido cambios fisiológicos de la actividad en el bazo y el corazón.

**Palabras clave:** componentes no-canal, niveles de concentrado, espesor de grasa, rendimiento de la canal.

### Introduction

The Brazilian beef has a great expressivity worldwide, being considered since 2004 as the largest exporter, approximately 1.9 million toneladas. ano-1 and the second largest producer, producing on average 9.2 million tons of product per year, keeping about 68% of the area of their territory with preserved forests (ABIEC, 2011; MAPA, 2011). Thus, the confinement is a vertical integration strategy in finishing beef cattle, which aims to reduce the impact of agriculture on the environment. Being the flexibility of this strategy arising from zootechnical parameters, carcass characteristics produced and of its components non members (OLIVEIRA, 2010).

In search of better performance, product quality and profitability, the Feedlot is providing animal diets with higher inclusion levels of concentrate feed. Being that these may end up in advantages in the finishing and carcass yield, in the proportion of prime cuts and organoleptic characteristics of meat (MISSIO et al., 2010). Since, higher rates of weight gain provide improvement in the softness, marbling, and therefore better palatability of the meat (VAZ et al. 2007).

The meatpacking industry has the body weight and degree of finishing as the main criteria for the purchase of livestock, and these parameters directly related to the final carcass weight, carcass yield, fat thickness and carcass fat distribution, factors considered as facilitators of marketing and acceptability of the product by the final consumer.

The evaluation of the parts non integrated of the carcass is important because, according Cumby (2000) size and metabolic rate of the vital organs are different in relation to other body parts of the animal, which may be directly related to food consumption, animal performance and energy requirements for maintenance.

The external components of the carcass do not represent remuneration to the cattleman, yet, have a direct influence on carcass yield and are of interest to refrigerators, as part of its operating expenses are financed through the sale of organs, hides, meat of the head and other waste intended for marketing, however, there are no studies that prove the real profitability of refrigeration systems (MISSIO et al., 2009).

Among other tools that aim to reduce the period of permanence of these animals in regime of stabling, as well as add greater profitability to the system, with a view also to non-aggression of the environment, are the products probiotic, synbiotic and its joints, organic modifiers, and the herbal medicine and homeopathy. In this way arises the need for the study of alternative food additives which may be employees in the Brazilian production conditions that assist in greater acceptance of Brazilian products in importing countries (GOMES et al., 2011).

Homeopathic medicines were first introduced in Germany in the era before the identification of microorganisms (RUEGG, 2011). In the fundamentals of homeopathy included the use of solutions

prepared from substances of vegetable, animal and / or mineral, diluted and dynamized, with the aim that the same impregnate the molecules used to their dilution, usually alcohol or sucrose, subjected to successive and vigorous shakes with each new dilution (REAL, 2008). The use of homeopathy has been used as an alternative to reduce the effects of stress in cattle because it keeps the animals more calm and can work in a better feed conversion and consequently in an average daily gain of greater weight (REAL, 1996).

In this sense, the goal is to carry out this work to assess the effects of homeopathic complex CONVERT H®, on carcass characteristics and components non integrating of the carcass of steers in confinement system using two diets (48 and 100% concentrate), in view of the lack of scientific information on the subject.

## Material and methods

The experiment was developed in the facilities of the Center for Animal Production (NUPRAN) of the Sector of Agricultural and Environmental Sciences of the Universidade Estadual do Oeste (UNICENTRO), in Guarapuava - PR, situated in the subtropical zone of Paraná (MAACK, 2002) under the geographical coordinates 25° 23' 02" south latitude and 51° 29' 43" west longitude and altitude of 1026 m.

The climate, according to Köppen classification, is temperate of altitude - Cfb (Subtropical mesothermal humid), with mild summers and moderate winter characterized by average temperature in the warmest month lower than 22 °C and average temperature in the coldest month below 18 °C, without dry season and with severe frosts. The average annual rainfall is 1944 mm, annual average minimum temperature of 12.7 °C, maximum annual average temperature of 23.5 °C and relative air humidity of 77.9% (IAPAR, 2000).

The objective was to evaluate the carcass characteristics and of components non integrate of the carcass of finished feedlot steers using different diets: T1 - 100% concentrate diet (80% maize grain + 20% core protein) *ad libitum* with homeopathy (100g day<sup>-1</sup> CONVERT H®); T2 - diet 100% concentrate (80% maize grain + 20% core protein) *ad libitum* without homeopathy, T3 - diet 48% concentrate: whole plant corn silage *ad libitum* + concentrate (5.5 kg animal<sup>-1</sup> day<sup>-1</sup>) with homeopathy (100g dia<sup>-1</sup> CONVERT H®), T4 - diet 48% concentrate: whole plant corn silage *ad*

*libitum* + concentrate (5.5 kg animal<sup>-1</sup> day<sup>-1</sup>) without homeopathy.

The silage used in animal feed was made from the hybrid SG 6418 silage features being used a spacing between lines of 0.80 m, with sowing depth distribution of 0.04 I 4.29 linear plants m<sup>-1</sup> totaling a final population of 53,625 plants ha<sup>-1</sup>. It was used in the occasion of the plantation a fertilization base of 400 kg ha<sup>-1</sup> with the 08-30-20 fertilizer (N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O), following Recommendations of Fertilization and Liming for the states of Rio Grande do Sul and Santa Catherine (CFS-RS/SC, 1995) and cover fertilization with 125 kg ha<sup>-1</sup> of N, in the urea form when plants were in the vegetative stage V4 (FANCELLI, 2010). In crop management within 30 days after plant emergence were applied: Herbicide (Commercial product Atrasina: 4 l ha<sup>-1</sup>) + mineral oil (Commercial product Assit: 1 l ha<sup>-1</sup>) and defensive to control fall armyworm (commercial product Karate: 150 ml ha<sup>-1</sup>).

The harvest of the plants was performed in the reproductive stage R4 (MS 30 to 33%), with the aid of a shredder brand® 9004 Nogueira generation 4 of the line, appropriately regulated to a particle size of 1 to 2 cm and height cutting of the plants between 15-20 cm. The material was transported and deposited in silos of type trench, located on a local leveled and well drained, with beaten earth floor and concrete walls with dimensions of 3.5 m wide, 10 m long and 1.5 m in height, and compacted with the aid of a tractor and subsequently completely sealed and protected with double sided polyethylene bags with about 150 µm.

The experiment was conducted during 119 days, with 14 days of adaptation to the diets of animals, experimental installations and night lighting, which sequentially passed through five periods of 21 days of evaluation. The facilities were composed of 16 individual pens of feedlot, semi-covered, with an area of 15 m<sup>2</sup> (2.5 mx 6.0 m) for two animals with a concrete feeder measuring 2.30 m long, 0.60 m wide and 0.35 m high, and a metallic drinking trough regulated by automatic float. We used 32 young bulls, Charolais breed, from the same herd, with an average age of 12 months and initial body weight of 323 kg with a standard deviation of 4 kg, wormed and balanced by weight and body condition for treatment, where the cubicle with two animals represented an experimental unit.

The feeding was done 2 times daily, at 6:00 am and at 17:00 pm, and voluntary food consumption was recorded daily by weighing of the quantity offered and leftovers from the previous day. In the

same way, the adjustment of the supply quantity of food in the diet treatment with 100% concentrate was performed daily (*ad libitum*), considering a leftover from 5% dry matter offered in relation to the consumed. Since the adjustment in the supply of food in the treatment with corn silage and concentrate was carried out so that the supply of corn silage was adjusted daily (*ad libitum*), whereas a leftover of 5% of the dry matter offered in relation to the consumption, however the amount of concentrate given to the animals was constant on the order of 5.5 kg animal<sup>-1</sup> from start to finish of the containment regardless of the level of consumption of roughage.

The adaptation of animals to diet 100% concentrate lasted 14 days, so the first 4 days was provided the proportion of 1.2% of body weight (BW) to the livestock of the concentrate mixture (core protein, vitamin and mineral : + 20% corn grain: 80%) and corn silage at will; room on the eighth day spent to provide 1.6% of PV the mixture of concentrate and corn silage at will; in the ninth day was provided 1.8% PV and corn silage at will; from the twelfth day was interrupted the supply of bulk food, offering only the mixture of concentrated in the feeder in the form "ad libitum" with daily adjustments of consumption.

For treating with silage, the amount of the concentrate offered to the animals was pre-set and adjusted according to the average of body weights of input (323 kg) and expected output (500 kg), in this manner the supplementation of concentrated food offered in the proportion of 1.15% of body weight, comprising a lump sum for the entire experimental period of 5.5 kg day<sup>-1</sup>.

Diet samples were collected at the start of the adaptation and during the experimental period. The samples of silage and of concentrate feeds were led to forced air oven at 55 °C until constant weight to partially dry matter determination. The pre-dried samples were ground in a mill type "Wiley" with sieve of 1 mm diameter and subsequently conducted for chemical analysis. In pre-dried samples of silage were estimated the contents of total dry matter in greenhouse of drying and sterilization at 105 °C, crude protein (CP) by the micro Kjeldahl method, mineral material (MM) by incineration at 550 °C for 4 hours and ether extract (EE) as techniques described in AOAC (1995). The contents of neutral detergent fiber (NDF) were obtained as method of VAN SOEST et al. (1991) with the enzyme  $\alpha$ -amylase thermo-stable and of acid detergent fiber (ADF) according GOERING and VAN SOEST (1970). The

mineral nutrients were analyzed according to the methodology described by TEDESCO et al. (1995).

The food concentrates, protein core of diet 100% concentrate and diet concentrate with silage were prepared in the commercial feed mill of the Agrarian Cooperative Agroindustrial located in the district of Entre Rios in Guarapuava - PR. In the preparation of food concentrates utilized the following ingredients: soybean meal, soybean hulls, wheat bran, radicle of malt, barley, grinded maize grains, corn germ, calcium carbonate, calcium phosphate, urea livestock, vitamin premix and mineral, salt and monensin. In the diet 100% concentrated core protein showed average levels percentage of MS of 90.22%, CP of 38.01%, EE of 2.34%, NDF of 22.20%, ADF of 11.08%, MM of 14.72% calcium (Ca) of 2.50% phosphorus (P) of 1.0% potassium (K) of 1.42% magnesium (Mg) 0.44%. Now the concentrated mixture used to make the diet with corn silage had average contents percentage of 89.20% DM, PB of 19.00%, EE of 3.95%, NDF of 28.66%, ADF of 13, 15%, MM of 7.34%, Ca of 1.20% and P of 0.50%, K of 0.77% and Mg of 0.34%. As for corn silage, this had average contents of 32.20% DM, CP of 7.61%, EE of 2.77%, NDF of 45.60%, ADF of 24.87% and MM of 3.59%, based in the dry matter.

The homeopathic product used was CONVERT H®, consisting of Natrum muriaticum 10<sup>-60</sup>, Calcium carb 10<sup>-30</sup>, Silicea earth 10<sup>-40</sup>, Hypothalamus 10<sup>-30</sup> and Vehicle qs. 1000 g. It has indications as promoter of organic balance and productivity of productive livestock and companion, we used a dosage of 100 g animal dia<sup>-1</sup>, being practiced the addition of the animal's diet at the time of its supply.

The animals were weighed at the beginning and end of the experimental period, with intermediate weighings every 21 days, after a fasting period of 12 hours. After the end of the experimental periods, obeying a fasting period of 12 hours, the animals were weighed at the time of loading to the refrigerator, resulting in the weight of the farm. The slaughter respected the normal flow of a commercial slaughterhouse, located 10 km from the experiment site, in accordance with the standards of animal welfare and ethics for slaughtering cattle. Then, with the removal of leather and viscera, the carcasses were identified, washed and cooled to -2 °C for 24 hours.

In the hot carcass were measured four steps of development: carcass length, which is the distance between the edge of the medial cranial of the pubic bone and medial cranial edge of the first

rib; arm length, which is the distance between the olecranon tuberosity and the the radio-carpiana; arm perimeter, obtained in the median region of the arm encircling with a tape measure; cushion thickness, measured through a compass positioned perpendicular to the length of the carcass, taking the longest distance between the cut separating the two half carcasses and lateral muscles of the thigh, and the fat thickness, being performed with a caliper at three pre-determined locations along the longissimus dorsi muscle, these being the sixth, ninth and twelfth thoracic vertebrae, according to the methodologies described by MÜLLER (1987).

During the flow of slaughter were measured the weights of the components are non integrated of the carcass as leather, rumen-reticulum filled, empty rumen-reticulum, abomasum filled, empty abomasum, small intestines and thick filled with, legs, lungs, spleen, head, tongue, liver, kidney, heart, diaphragm and tail.

The experimental design was completely randomized, with four treatments with four replicates, where each replicate consisted of a cubicle with two animals. The collected data for each variable were subjected to analysis of variance to comparison of averages at the 5% significance through the statistical program SAS (1993).

The experiment was conducted in view of the principles of welfare and ethics with experimental animals and was approved by the ethics committee for animal use Universidade Estadual do Centro Oeste (CEUA / UNICENTRO) as seem of the craft 028/2011 of 15 August of 2011.

## Results and discussion

For the parameters concentrate level and use of homeopathy, evaluated individually or combined for the carcass characteristics, there wasn't significant differences ( $P>0.05$ ), observing average values of 499.5 kg of body weight of the farm, 274.2 kg of hot carcass weight, 54.7% of carcass yield, 4.2 mm of thickness of fat, 127.5 cm long of carcass, 23.3 cm of leg thickness, 41.1 cm of length of arm and 36.9 cm of the perimeter of the arm (Table I).

Following a similar methodology performed in this work, working with Charolais steers having different genetic degrees, FERREIRA et al. (2006) also observed no significant differences in carcass characteristics, these results that meet with the present work, both in the requirement level of

concentrate as in the category of homeopathy.

However, RIBEIRO et al. (2010) reported significant correlations between hot carcass weight (273 vs. 266kg), carcass yield (56 versus 55%), cold carcass weight (264 vs. 261kg), cold carcass yield (55 versus 54%), loss of weight by cooling (2.92 versus 1.88%) and equivalent boning (200 versus 195kg) of carcasses of Nelore steers and Tabapuã supplemented with homeopathy compared to non-supplemented animals, respectively.

ZANETTE et al. (2011) evaluating carcass characteristics of Charolais crossbred steers finished in feedlot, showed differences only for questions of fat thickness (4.7, 4.1 and 3.7 mm) and fat distribution (5.5, 4.0 e 3.8%) for corn silage supplemented with commercial enzyme-bacterial inoculants, sugar and control treatment, respectively. No statistical difference was found for the characteristics of body weight of farm, hot carcass weight, carcass yield, leg thickness, arm length and arm perimeter, these results which corroborate with of the present work.

Using Charolais crossbred steers and concentrate levels very close to those adopted in the present work, UENO (2012) found significant differences only to arm perimeter (39.60 versus 37.10 cm, to 100% and 55% concentrate, respectively), and this result may be attributed to the different genetic level presented by animals.

MISSIO et al. (2010) also evaluating concentrate levels (22, 40, 59, 79%) in corn silage diets found no significant differences in carcass yield with an average of 58, 30%. However, Silva et al. (2002) evaluating concentrate levels (20, 40, 60, 80%) in diets with tropical grass hay observed increased linear effect in carcass yield with increasing levels of concentrate, the yields were 56.8%, 59.6%, 60.7%, 61.3%, for the respective levels of concentrate, which was attributed to decrease in the gastrointestinal content.

The fact that many studies did not demonstrate statistical differences in the carcass characteristics, is directly linked to productive efficiency of the system, where animals of the same genetic group, having the same age and with similar weight tend not to differ on these characteristics, considering the results of a system better when younger animals have a greater development (MÜLLER, 1987).

Thus we can justify the present result with the work performed by Restle et al. (2001), in which the authors stated that when used bulky foods with high passage rate are not found differences in carcass yield between animals fed with different levels of concentrate.

**Table 1.** Carcass characteristics of steers finished in feedlot with two concentrate levels associated with the use of homeopathy.

Level of Concentrate	Homeopathy		Average
	With	Without	
<b>Body weight of the farm, kg</b>			
48% concentrate	512.5	493.1	502.8 a
100% concentrate	49.5	495.0	496.3 a
Average	505.0 A	494.1 A	
<b>Hot carcass weight, kg</b>			
48% concentrate	281.0	268.8	274.9 a
100% concentrate	275.8	271.2	273.5 a
Average	278.4 A	270.0 A	
<b>Carcass Yield, %</b>			
48% concentrate	54.7	54.3	54.5 a
100% concentrate	55.3	54.6	55.0 a
Average	55.0 A	54.5 A	
<b>Fat Thickness, mm</b>			
48% concentrate	3.8	4.6	4.2 a
100% concentrate	4.4	3.9	4.2 a
Average	4.1 A	4.3 A	
<b>Carcass Length, cm</b>			
48% concentrate	130	130	130 a
100% concentrate	120	130	125 a
Average	125 A	130 A	
<b>Leg Thickness, cm</b>			
48% concentrate	23.5	23.6	23.6 a
100% concentrate	23.3	23.0	23.1 a
Average	23.4 A	23.3 A	
<b>Arm Length, cm</b>			
48% concentrate	41.8	42.0	41.9 a
100% concentrate	40.0	40.5	40.3 a
Average	40.9 A	41.3 A	
<b>Perimeter of the arm, cm</b>			
48% concentrate	37.1	37.0	37.1 a
100% concentrate	37.8	35.5	36.7 a
Average	37.5 A	36.3 A	

Averages in the column followed by different lower case letters and / or on the line, followed by different capital letters differ from each other by Test "F" 5%.

In Table II shows the average weights of the components of carcass yield, expressed in kg, as in Table III, are exposed the components of carcass yield expressed in percentage of the body weight of steers finished in feedlot with two levels of concentrate associated with the use of homeopathy.

Generally speaking, the use of homeopathy and / or the level of concentrate in the diet of steers under

individual or combined effects, does not promoted changes ( $P > 0.05$ ) in the weights of the tongue, head, tail, liver, kidneys, lungs, full reticulo-rumen and filled intestines, with average values of 0.93 kg, 12.4 kg, 1.52 kg, 6.0 kg, 1.0 kg, 7.0 kg, 34.9 kg and 18 87 kg, respectively.

On the other hand, animals finished with 100% concentrate diet, regardless of the use of homeopathy had higher ( $P < 0.05$ ) heart weights (1.70 versus 1.55 kg), leather (45.10 versus 40.65 kg) and spleen (2.05 versus 1.45 kg) also showed differences in measurements of wide (18.95 to 16.05 cm) and length (57.25 to 50.75 cm) in spleen compared with the diet 48% concentrate.

UENO (2012) found significant results in relation to the weight of the spleen (3.03 versus 1.65 kg) for animals fed with the diet 100% concentrate and 55% concentrate, respectively. This fact justified by the author as correlated to the increase in digestible energy intake and reduction of fat of the abomasum, being that this did not change the influence of proportions of external components of the carcass with the increase in the levels of concentrate, but had influence in a linear increase in the proportion of the gastrointestinal tract and internal fat.

PACHECO et al. (2006) working with castrated crossed steers Nellore x Charolais, found no correlations between the external components of the carcass and carcass yield obtained. However, RESTLE et al. (2001) correlated higher weights of the head and smaller leather weights with highest carcass yields of crossed steers Nellore x Hereford superyoungs.

Was not found significant changes in the weights, expressed in % of the body weight, under individual or combined effects between homeopathy and concentrate level for the parameters tongue weight, head, tail, kidneys, lungs, filled reticulum-rumen and filled intestines, presenting average values of 0.20%, 2.50%, 0.27%, 0.21%, 1.40%, 6.92% and 3.75%, respectively.

Animals ending with diet 100% concentrate, regardless of the use of homeopathy had higher ( $P < 0.05$ ) weights, expressed in % of body weight, of heart (0.30 vs 0.35%), liver (1.30 versus 1.10%) and leather (9.00 versus 8.05%), compared to a diet with 48% concentrate.

YÜKSEL et al. (2009), evaluating different proportions of wheat straw and wet sugar beet pulp in the diet of Holstein steers, did not demonstrate differences in relation to body weight, of the components non integrated of the carcass. Now

**Table 2.** Average weights of the components of carcass yield expressed in kg of finished in feedlot steers with two concentrate levels associated with the use of homeopathy.

Level of Concentrate	Homeopathy		Average
	With	Without	
<b>Tongue weight, kg</b>			
48% concentrate	1.00	0.90	0.5 a
100% concentrate	0.90	0.90	0.90 a
Average	0.95 A	0.90 A	
<b>Head weight, kg</b>			
48% concentrate	12.7	12.7	12.7 a
100% concentrate	11.9	12.5	12.2 a
Average	12.3 A	12.6 A	
<b>Tail weight, kg</b>			
48% concentrate	1.50	1.40	1.45 a
100% concentrate	1.60	1.60	1.60 a
Average	1.55 A	1.50 A	
<b>Heart weight, kg</b>			
48% concentrate	1.60	1.50	1.55 b
100% concentrate	1.70	1.70	1.70 a
Average	1.65 A	1.60 A	
<b>Liver weight, kg</b>			
48% concentrate	5.60	5.30	5.45 a
100% concentrate	6.60	6.50	6.55 a
Average	6.10 A	5.90 A	
<b>Kidneys weight, kg</b>			
48% concentrate	1.00	1.00	1.00 a
100% concentrate	0.90	1.10	1.00 a
Average	0.95 A	1.05 A	
<b>Lungs weight, kg</b>			
48% concentrate	6.80	7.40	7.10 a
100% concentrate	6.80	6.90	6.85 a
Average	6.80 A	7.15 A	
<b>Filled reticulum-rumen weight, kg</b>			
48% concentrate	38,80	34,40	36,6 a
100% concentrate	34,00	32,40	33,2 a
Average	36,4 A	33,4 A	
<b>Empty reticulum-rumen weight, kg</b>			
48% concentrate	9.20	8.10	8.65 a
100% concentrate	9.20	9.50	9.35 a
Average	9.20 A	8.8 A	
<b>Full intestines weight, kg</b>			
48% concentrate	20.70	15.80	18.25 a
100% concentrate	18.90	20.10	19.50 a
Average	19.80 A	17.95 A	
<b>Leather weight, kg</b>			
48% concentrate	42.70	38.60	40.65 b
100% concentrate	45.30	44.90	45.10 a
Average	44.00 A	41.75 A	
<b>Spleen width, cm</b>			
48% concentrate	16.80	15.30	16.05 b
100% concentrate	19.00	18.90	18.95 a
Average	17.90 A	17.10 A	
<b>Spleen length, cm</b>			
48% concentrate	52.00	49.50	50.75 b
100% concentrate	57.00	57.50	57.25 a
Average	54.50 A	53.50 A	
<b>Spleen weight, kg</b>			
48% concentrate	1.50	1.40	1.45 b
100% concentrate	2.00	2.10	2.05 a
Average	1.75 A	1.75 A	

Averages in the column followed by different lower case letters and/or on the line, followed by different capital letters differ from each other by Test "F" 5%.

**Table 3.** Average weights of the components of carcass yield, expressed as % of body weight of steers finished in feedlot with two concentrate levels associated with the use of homeopathy.

Level of concentrate	Homeopathy		Average
	With	Without	
<b>Tongue weight, % PV</b>			
48% concentrate	0.20	0.20	0.20 a
100% concentrate	0.20	0.20	0.20 a
Average	0.20 A	0.20 A	
<b>Head weight, % PV</b>			
48% concentrate	2.50	2.60	2.55 a
100% concentrate	2.40	2.50	2.45a
Average	2.45 A	2.55 A	
<b>Tail weight, % PV</b>			
48% concentrate	0.30	0.30	0.30 a
100% concentrate	0.30	0.20	0.25 a
Average	0.30 A	0.25 A	
<b>Heart weight, % PV</b>			
48% concentrate	0.30	0.30	0.30 b
100% concentrate	0.30	0.40	0.35 a
Average	0.30 A	0.35 A	
<b>Liver weight, % PV</b>			
48% concentrate	1.10	1.10	1.10 b
100% concentrate	1.30	1.30	1.30 a
Average	1.20 A	1.20 A	
<b>Kidneys weight, % PV</b>			
48% concentrate	0.20	0.20	0.20 a
100% concentrate	0.20	0.20	0.20 a
Average	0.20 A	0,0 A	
<b>Lungs weight, % PV</b>			
48% concentrate	1.30	1.50	1.40 a
100% concentrate	1.40	1.40	1.40 a
Average	1.35 A	1.45 A	
<b>Filled reticulum-rumen weight, % PV</b>			
48% concentrate	7.50	6.90	7.20 a
100% concentrate	6.80	6.50	6.65 a
Average	7.15 A	6.70 A	
<b>Empty reticulum-rumen weight, % PV</b>			
48% concentrate	1.80	1.60	1.70 a
100% concentrate	1.90	1.90	1.90 a
Average	1.85 A	1.75 A	
<b>Full intestines weight, % PV</b>			
48% concentrate	4.00	3.20	3.60 a
100% concentrate	3.80	4.00	3.90 a
Average	3.90 A	3.60 A	
<b>Leather weight, % PV</b>			
48% concentrate	8.30	7.80	8.05 b
100% concentrate	9.00	9.00	9.00 a
Average	8.65 A	8.40 A	
<b>Spleen weight, % PV</b>			
48% concentrate	0.30	0.30	0.30 a
100% concentrate	0.40	0.40	0.40 a
Average	0.35 A	0.35 A	

Averages in the column followed by different lower case letters and / or on the line, followed by different capital letters differ from each other by Test "F" 5%.

RODRIGUEZ (2012) evaluating crossed steers Brahman x Charolais whole and with different ages of castration, found statistical differences ( $P < 0.05$ ) only for the criterion of bones and fat in relation to body weight, with an average of castrated animals of 22.43% and 24.20% of whole animals.

According to CUMBY (2000), the size and metabolic rate of the vital organs are different in relation to other body parts of the animal can be directly related to food consumption, animal performance and energy requirements for maintenance, so it is justified its measurement.

## Conclusions

The homeopathy showed no performance on the the carcass characteristics and components non integrate of the carcass of the animals finished with diet 100% concentrate and / or animals finished with 48% concentrate more the corn silage.

The use of different levels of concentrate in the diet of steers did not change the characteristics of carcasses however the diet 100% concentrated has physiological performance at the level of spleen and heart.

## References

- ABIEC. Associação Brasileira das Industrias Exportadoras de Carne. **Pecuária Brasileira**, 2011. Disponível em: <[http://www.abiec.com.br/3\\_pecuaria.asp](http://www.abiec.com.br/3_pecuaria.asp)>. Acesso em 23/04/2012.
- ASSOCIATION OF OFFICIAL ANALYTICAL CHEMISTS - A.O.A.C. 1995. **Official methods of analysis**. 16.ed. Washington, D.C.: AOAC, 1995. 2000p.
- BRASIL. Ministério da Agricultura, Pecuária e Abastecimento. **Espécies, Bovinos e Bubalinos**. Disponível em: <<http://www.agricultura.gov.br/animal/especies/bovinos-e-bubalinos>>. Acesso em 03/04/2012.
- CFS-RS/SC. COMISSÃO DE FERTILIDADE DO SOLO – RS/SC. **Recomendações de adubação e calagem para os Estados do Rio Grande do Sul e Santa Catarina**. 3ed. Passo Fundo: SBCS-Núcleo Regional Sul : EMBRAPA-CNPT, 1995. 223p.
- CUMBY, J. Visceral organ development Turing restriction and re-alimentation. **In. Proceedings COURSE IN RUMINANT DIGESTION AND METABOLISM – ANSC 6260**. CANT, J. (Ed.) Guelph: University of Guelph, p.23-29, 2000.
- FANCELLI, A.L. **Boas Práticas para o Uso Eficiente de Fertilizantes na Cultura do Milho**. Piracicaba: International Plant Nutrition Institute Brazil, 2010. p.1-16, 2010 (Informações Agronômicas, 131).
- FERREIRA, J.J.; BRONDANI, I.L.; LEITE, D.T.; RESTLE, J.; ALVES FILHO, D.C.; MISSIO, R.L.; HECK, I.; SEGABINAZZI, L.R. Características da carcaça de tourinhos Charolês e mestiços Charolês x Nelore terminados em confinamento. **Ciência Rural**, v.36, n.1, p.191-196, 2006.
- GOERING, H.K.; SOEST, P.J. Van. Forage Fiber Analysis: Apparatus Reagents, Procedures and Some Applications. Washington, D.C: American Research Service. **Agricultural Handbook**. 1970. 379p.
- GOMES, R.C.; ANTUNES, M.T.; SILVA, S.L.; LEME, P.R. Desempenho e Digeribilidade de Novilhos Zebuínos Confinados Recebendo Leveduras Vivas e Monensina. **Archivos de Zootecnia**, v.60, n.232, p.1077-1086, 2011.
- HEINRICH, J.; KONONOFF, P. J. Evaluating Particle Size of Forages and TMRs Using the New Penn State Forage Particle Separator. University Park: **Pennsylvania State University/Dairy & Animal Science**, Pennsylvania, 14p., 2002.
- IAPAR - Instituto Agronômico do Paraná. **Cartas Climáticas do Paraná**. Versão 1.0. 2000. (formato digital, 1 CD).
- MAACK, R. **Geografia física do Estado do Paraná**. 3. ed. Curitiba: Imprensa Oficial. 2002.
- MISSIO, R.L.; BRONDANI, I.L.; RESTLE, J.; SILVA, J.H.S.; SILVEIRA, M.F.; SILVA, V.S. Partes não-integrantes da carcaça de tourinhos alimentados com diferentes níveis de concentrado na dieta. **Revista Brasileira de Zootecnia**, v.38, n.5, p.906-915, 2009.



MISSIO, R.L.; BRONDANI, I.L.; ALVES FILHO, D.C.; RESTLE, J.; ARBOITTE, M.Z.; SEGABINAZZI, L.R. Características da carcaça e da carne de tourinhos terminados em confinamento, recebendo diferentes níveis de concentrado na dieta. **Revista Brasileira de Zootecnia**, v.39, n.7, p.1610-1617, 2010.

MULLER, L. **Normas para avaliação de carcaça e concurso de carcaças de novilhos**. 2 ed. Santa Maria: Universidade Federal de Santa Maria, 1987, 31p.

OLIVEIRA, M.R. **Efeito do Estádio de Maturação na Qualidade de Silagens de Milho na Resposta Econômica de Novilhos Confinados**. Dissertação (Mestrado em Agronomia) - Curso de Pós-graduação em Agronomia, Universidade Estadual do Centro Oeste, Guarapuava-PR, 2010. 125f.

PACHECO, P.S.; RESTLE, J.; VAZ, F.N.; FREITAS, A.K.; PADUA, J.T.; NEUMANN, M.; ARBOITTE, M.Z. Avaliação econômica da terminação em confinamento de novilhos jovens e superjovens de diferentes grupos genéticos. **Revista Brasileira de Zootecnia**, v.35, n.1, p.309-320, 2006.

REAL, C.M. **Lei dos Semelhantes**. Anais do XV PANVET -. Campo Grande, Mato Grosso do sul. 1996.

REAL, C.M. Homeopatia Populacional - Fundamentos, Ruptura de um Paradigma. **Revista A Hora Veterinária** - Ano 28, n.164, 2008.

RESTLE, J.; VAZ, F.N.; ALVEZ FILHO, D.C.; PASCOAL, L.L.; OLIVEIRA, A.N.; FATURI, C.; ARBOITTE, M.Z. Efeito da suplementação energética sobre a carcaça de vacas de diferentes idades, terminadas em pastagem cultivada de estação fria sob pastejo horário. **Revista Brasileira de Zootecnia**, v.30, n.3, p.1076-1083, 2001.

RIBEIRO, J.S.; GONÇALVES, T.M.; MACHADO NETO, O.R.; CAMPOS, F.R.; FARIA, W.L. Homeopatia na Terminação de Novilhos Nelores e Tabapuã Confinados. **Agropecuária Científica no Semi-Árido**, v.07, n.01, p.38 - 44, 2011.

RODRIGUEZ, J. **Effects of castration on carcass composition, meat quality, and sensory properties of beef produced in a tropical climate**. A Thesis (Master of Science) - Kansas State University, Manhattan, Kansas, 2012. 93f.

RUEGG, P.L. Tratamento da Mastite Clínica - O que nos Dizem as Pesquisas. In. **Anais XV Curso Novos Enfoques na Produção e Reprodução de Bovinos**. Uberlândia-MG, 2011.

SAS INSTITUTE. **SAS/STAT user's Guide**: statistics, version 6. 4.ed. North Caroline, 1993. v.2, 943p, 1993.

SILVA, F.F.; VALADARES FILHO, S.C.; ÍTAVO, L.C.V.; VELOSO, C.M.; PAULINO, M.F.; VALADARES, R.F.D.; CECON, P.R.; SILVA, P.A.; GALVÃO, R.M. Desempenho, características de carcaça e biometria do trato gastrointestinal e dos órgãos internos de novilhos nelore recebendo dietas com diferentes níveis de concentrado e proteína. **Revista Brasileira de Zootecnia**, v.31, n.4, p.1849-1864, 2002.

TEDESCO, M.J., GIANELLO, C., BISSANI, C.A., BOHNEN, H.; VOLKWEISS, S.J. **Análises de solo, plantas e outros materiais**. 2. ed. Porto Alegre-RS: Universidade Federal do Rio Grande do Sul, 174p., 1995 (Boletim técnico, n.5).

UENO, R.K. **Avaliação bioeconômica da cultura do milho (*Zea mays* L.) utilizada sob diferentes formas na alimentação de novilhos em confinamento**. Dissertação (Mestrado em Agronomia - Produção Vegetal) - Universidade Estadual do Centro Oeste - UNICENTRO, Guarapuava-PR, 2012. 152f.

VANSOEST, P. J.; ROBERTSON, J. B.; LEWIS, B. A. Symposium: Carbohydrate Methodology, Metabolism, and Nutritional Implications in Dairy Cattle. Methods for Dietary Fiber, Neutral Detergent Fiber, and Nonstarch Polysaccharides in Relation to Animal Nutrition. **Journal of Dairy Science**, v.74, n.10, p.3583-3597, 1991.

VAZ, F.N.; RESTLE, J.; PADUA, J.T.; METZ, P.A.M.; MOLETTA, J.L.; FERNANDES, J.J.R. Qualidade da carcaça e da carne de novilhos abatidos com pesos similares, terminados em diferentes sistemas de alimentação. **Ciência Animal Brasileira**, v.8, n.1, p.31-40, 2007.

YÜKSEL, S.; YANAR, M.; TURGUT, L.; ÖZLÜTÜRK, A.; KOPUZLU, S.; SEZGIN, E. Feed efficiency and carcass and meat quality characteristics of bulls finished on diets containing varied proportions of wheat straw and wet sugar beet pulp. **South African Journal of Animal Science**, v.39, n.4, 2009.

*Marafon et al. (2012)*

ZANETTE, P.M.; NEUMANN, M. SANDINI, I.; MARAFON, F.; MARIA, F.N.; POCZYNECK, M. Características da carcaça de bovinos e digestibilidade de silagens de milho (*zea mays* L.) com adição de açúcar ou inoculante enzimo-bacteriano. **Revista Brasileira de Milho e Sorgo**, v.10, n.3, p.235-246, 2011.