A14

CARCASS TISSUE DISTRIBUTION AND COMPOSITION OF THE LEAN MEAT FROM KIDS FED AN IRON SUPPLEMENTED DIET

JORGE F.F. ZAPATA, NELSON N. BARROS, NADJA M.S. VASCONCELOS & IRACEMA F. MOURA
Departamento de Tecnologia de Alimentos, Universidade Federal do Ceará, Caixa Postal 12168, 60020-181 Fortaleza, CE, Brasil

Keywords: kid carcass, meat composition, iron content

BACKGROUND

Goat meat represents about 4% of the world meat from ruminants with major production and consumption in Asia, Africa and Latin America (KIRTON, 1992). Meat preference in most Asiatic and African countries is for the foresaddle of lean animals, 1 to 2 years old, with up to 8% fat. American and European markets, on the other hand, tend to prefer succulent and tender cuts like leg and loin from the hindsaddle from young animals (SAITHANOO & HUQ, 1992). Young kids (15 to 35 days of age) are currently raised and marketed around the Mediterranean region (France, Italy and Spain) and in some Latin American countries. In France and Spain kids are usually slaughtered with 3 to 7 weeks and 6 to 11 kg weight (MORAND-FEHR *et al.*, 1992). According to WILSON (1992), however, most of the goat meat production around the word comes from small farms with poor hygienic conditions. In addition to these factors ZAPATA (1994) states that low acceptance of goat and sheep meat in Northeast Brazil is due, in part, to inferior flavor and texture characteristics associated with advanced age of slaughtering.

OBJECTIVES

This work was planned to verify the effect of iron supplementation to a milk replacer used to feed kids to the ninth week of age on carcass tissue distribution and on lean meat proximal composition and iron content.

METHODS

Carcasses used in this study came from nine week old kids that had been weaned 48 hours after birth, fed a basal diet consisting of caw milk at the rate of 20% of their body weight to the seventh week of age, when milk supply was kept constant to slaughter time in the ninth week. Besides milk animals were allowed to feed, *ad libitum*, on a concentrate mixture and *Clitorea ternata* hay. Iron supplement was administered in the form of intramuscular injections of 150 mg iron dextran as to define the following treatments: A.- Basal diet with no Fe

TABLE 1. Hindquarter and forequarter yields in 9 week old kids fed iron suplemented diets (N=3)

Treatment	Half carcass (kg)	Hindquarter (kg)	Hindquarter (%)	Forequarter (kg)	Forequarter (%)
A	2.48	1.07	43.15	1.37	55.24
B	2.28	0.99	43.42	1.29	56.58
C	2.42	1.08	44.66	1.33	54.96
D	2.33	1.08	46.35	1.24	53.22

TABLE 3. Proximal composition of lean meat from 9 weeks kids fed iron suplemented diets (N=3)

Treatment	Moisture (%)	Protein (%)	Fat (%)	Ash (%)	Fe (mg/100g)
A	74.41	19.13	3.52	1.01	1.71
B	73.72	18.52	3.70	1.12	1.30
C	74.12	19.17	4.63	1.05	1.40
D	74.40	19.17	3.84	1.00	1.50

TABLE 2. Carcass lean trimmings, fatty and connective tissue trimmings and bone from 9 weeks old kids fed iron supplemented diets (N=3)

Treatment/Cut	Quarter, kg	Meat, %	Lean trim., %	Fatty trim., %	Bone tissue, %
A/Hindquarter	1.11	71.17	61.20	9.01	28.83
B/Hindquarter	0.99	70.71	63.75	7.08	30.65
C/Hindquarter	1.08	72.84	58.35	14.56	28.09
D/Hindquarter	1.08	71.23	59.58	11.01	29.13
A/Forequarter	1.38	65.69	55.81	9.34	37.31
B/Forequarter	1.29	63.68	50.91	12.42	35.72
C/Forequarter	1.33	63.80	51.23	12.53	35.35
D/Forequarter	1.24	63.15	54.13	8.88	37.17

supplementation; B. Basal diet plus Fe injection with 2 days of age. C.- Basal diet plus Fe injections with 2 and 16 days of age; D.- Basal diet plus Fe injections with 2, 16 and 30 days of age. After slaughter carcasses were cut in halves and frozen until analysis. The left half carcass from three animals from each treatment were thawed and cut into hindquarter and forequarter by inserting the knife between the 12th and 13th ribs. Quarters were weighed and then dissected to separate lean trimmings, fatty and connective tissue trimmings and bone. Lean meats from the hindquarter and forequarter were combined and analyzed for moisture, protein, fat, ash and iron contents.
Moisture was determined by drying to constant weight in oven at 105 °C (LANARA, 1981). Protein by the method of Kjeldahl for nitrogen using 6,25 as a conversion factor (LANARA, 1981). Fat by extracting dehydrated samples with hexane for 6 hours in a Model 044/8 extractor (TECNAL, Ltda., Piracicaba, São Paulo, Brasil). Ash content was assessed by incineration on furnace at 545 °C (LANARA, 1981). Iron was determined according to the spectrophotometric method described by CHRISTIAN (1986).

RESULTS AND DISCUSSION

Left half carcasses from 9 week old kids varied from 2.28 kg to 2.48 kg (TABLE 1), with no significant (P<0.05) effect of feeding treatments. Average carcass weight (4.8 kg) was in the range of 3.5 kg to 7.0 kg reported by MORAND-FEHR *et al.* (1992), for very young kids with 3 to 7 weeks used in France and Spain. The weight of hindquarters and forequarters represented 43.15% to 46.35% and 53.22% to 56.58% of the carcass, respectively (TABLE 1).
Hindquarters produced 58.35% to 61.2% lean meat, 7.08% to 14.56% fat and connective tissue, and 28.09% to 30.65% bones. Forequarters produced 50.91% to 55.81% lean meat, 8.88% to 12.53% separable fat and connective tissue, and 35.35% to 37.31% bones. These values are similar to those reported by Ibrahim & Gaili (1982) and Jotee (1984), quoted by WILSON (1992), for male Sudan Desert goats and for Anglo-Nubian goats from Mauritius.
Proximal composition of kid meat (TABLE 3) showed fat content relatively low (3.52% to 4.63%) when compared to other types of red meats (BECHTEL, 1986). According to MORAND-FEHR *et al.* (1992) muscle from young goats is light red with very white fat. Goat meat has less fat and higher levels of moisture and protein than lamb (WILSON, 1992).
Iron content in the lean from kids ranged from 1.30 mg/100g to 1.7 mg/100g (TABLE 3) with no significant (P<0.05) effect from feeding treatments. These values are within the range of 1.0 mg/100g to 1.8 mg/100g reported by BECHTEL (1986) for raw lamb. According to CASEY (1992), lean meat from adult goat contains 4.3 mg iron/100g and presents intense red color.

CONCLUSIONS

Artificial feeding of 1/2 Moxotó-Brown Alpine kids with caw milk supplemented with up to 150 mg Fe during artificial milk feeding for 9 weeks did not show significant (P<0.05) effect on carcass tissue yield and on proximal composition and Fe level in the lean meat.

REFERENCES

BECHTEL. P.J., ed. **Muscle as Food.** Academic Press Inc., Orlando. 1986. 459 pp.

CASEY, N.H. Goat Meat in Human Nutrition. In: **V INTERNATIONAL CONFERENCE ON GOATS:** MARCH 1992, New Delhi, India, PRE-CONFERENCE PROCEEDINGS, Vol. II, Part II. p.581-598.

CHRISTIAN, G.D. **Analytical Chemistry, 4th edition.** John Wiley & Sons, Inc., New York. 1986.

KIRTON, A.H. Goat Meat Production and Processing. In: **V INTERNATIONAL CONFERENCE ON GOATS:** MARCH 1992, New Delhi, India, PRE-CONFERENCE PROCEEDINGS, Vol. II, Part II. p.436-439.

LANARA-LABORATÓRIO NACIONAL DE REFERÊNCIA ANIMAL. **Métodos Analíticos Oficiais para Controle de Produtos de Origem Animal e seus Ingredientes. II Métodos Físicos e Químicos.** Ministério da Agricultura, Secretaria Nacional de Defesa Agropecuária, Brasília, DF, 1981.

MORAND-FEHR, P.; FALAGAN, A.; RUBINO, R.; MOWLEM, A. and SKJEVDAL, T. Goat Meat Production and Processing in Europe. In: **V INTERNATIONAL CONFERENCE ON GOATS:** MARCH 1992, New Delhi, India, PRE-CONFERENCE PROCEEDINGS, Vol. II, Part II. p.473-486.

SAITHANOO, S.; HUQ, M.A. Goat Meat Production and Processing in Asia. In: **V INTERNATIONAL CONFERENCE ON GOATS:** MARCH 1992, New Delhi, India, PRE-CONFERENCE PROCEEDINGS, Vol. II, Part II. p.451-457.

WILSON, R.T. Goat Meat Production and Research in Africa and Latin America. In: **V INTERNATIONAL CONFERENCE ON GOATS:** MARCH 1992, New Delhi, India, PRE-CONFERENCE PROCEEDINGS, Vol. II, Part II. p.451-457.

ZAPATA, J.F.F. Tecnologia e Comercialização de Carne Ovina. **Anais da I Semana da Caprinocultura e da Ovinocultura Tropical Brasileira**, Sobral, CE, julho de 1994, EMBRAPA-CNPC. Documentos, 23, p. 115-128. 1994.