SORY EVALUATION OF MEAT IN YOUNG BULLS FED WITH DIFFERENT DIETS

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MARY

effects of diet, breed and sire on meat palatability were assessed by trained sensory panel amples of M. *Longissimus dorsi* for tenderness, juiciness and flavor. 72 Brown Swiss and 36 naico bulls were fed with one of these seven diets: *ad libitum* on concentrates; lucerne hay aize silage plus 2 or 4 kg of concentrates until they reached 400 kg live weight and then ived a finishing period on concentrates; or lucerne hay or maize silage plus 4 kg of ncentrates until they reached the slaughter weight 480 kg weight approximately without finishing iod.

ls fed with lucerne hay supplemented with 2 kg concentrate and finishing period had lower res for tenderness (P<0.05) and juiciness (P<0.01) than animals fed with maize silage supple- ed with 2 or 4 kg of concentrate and finishing period before slaughter, or than bulls fed with cerne hay supplemented with 4 kg concentrate with finishing period. Intermediate scores for derness and juiciness showed animals fed with concentrates or with 4 kg supplemented forage thout finishing period. Flavor was not influenced by diet. Animals fed different proportions concentrates had an uneven overall appreciation.

her tenderness and juiciness (P<0.01) were recorded within meat with ultimate pH>6.5, pH 6.0- and pH<6.0 and lower overall (P<0.01) was recorded when pH<6.0, but no difference was found flavor within groups of different ultimate pH.

et by pH interaction showed that meat with pH<6.0 from animals fed with forage supplemented with g of concentrate and finishing period before slaughter, tended to have lower sensory scores r tenderness, juiciness and overall, but when pH>6.0 the sensory scores values increased and significant differences were found owing to the diet. No breed effect was found. The mean re for tenderness and juiciness (P<0.001), flavor and overall appreciation (P<0.05) were fected by sire. Sire by pH interaction was significant for tenderness (P<0.001), juiciness, avor (P<0.05) and overall (P<0.01). The results of this study indicate that the effect of timate pH on meat palatability was greater than diet, breed or sire effects. The interaction pH and diet suggests that meat palatability could be influenced by diet when pH is lower than 0 but this effect tends to disappear when pH is greater than 6.0 and then meat presents DFD rk, firm and dry) palatability attributes.

TRODUCTION

e meat palatability from beef may be influenced by the diet fed to animals. Some times one says at animals reared on pasture have a "grassy flavor" (LARICK et al., 1987), nevertheless as ncentrate fed animals have "grain flavor". Protein and mainly energy concentration of the diet

are a great influence on daily gain and fat carcass composition; and this daily gain a... indirectly, age is related with the connective tissue (Touraille, 1982). The quantity... subcutaneous, intermuscular and intramuscular fat could give variations on flavor and juicin... of the meat. The individual sensibility for stress of the animals before slaughter will determ... the ultimate pH and this is the great importance on the subsequent meat quality.

The objective of this work was to study the influence of diet, breed, sire and ultimate pH on ... meat sensory traits.

MATERIAL AND METHODS

72 Brown Swiss and 36 Pirenaico bulls were fed with one of these seven diets: *ad libitum* ... concentrates; lucerne hay or maize silage plus 2 or 4 kg of concentrates until they reached ... kg live weight and then received a finishing period on concentrates; or lucerne hay or ma... silage plus 4 kg of concentrates without finishing period, until they reached the slaughter weig... 480 kg approximately. At 24 h the pH of muscle *Longissimus dorsi* was measured with a penetrati... pH-metre.

The carcasses were segregated into three groups by ultimate pH at 24 h pH<6.0; pH 6.0-6.5 a... pH>6.5. After aging at vacuum 7 days at 4ºC the 8-9 M. *Longissimus dorsi* ribs were cut into ... cm steaks and frozen for subsequent taste panel evaluation. The steaks were thawed at 4ºC for ... h prior to cooking and serving. One steak per diet evaluated at the same time balanced by bre... and pH, were placed in a preheated grill at 160ºC and removed when internal temperature was 55º... Muscle strips were served on preheated plates to eight trained taste panel members. The pa... sampled for tenderness, juiciness, flavour and overall appreciation. The rating scale was 10... extremely tender, extremely juicy, intense beef flavour, high quality and 1= extremely tough... extremely dry, tasteless, low quality.

Table 1 Palatability traits by diet, breed and ultimate pH. Means by diet

DIET	C	H4+F	H2+F	H4	S4+F	S2+F	S4	DIET	pH	BREED	DxpH
N	728	368	96	264	376	104	264				
TENDERNESS	55.8ab	58.5a	54.4b	58.7a	58.7a	59.0a	56.3ab	2.3*	133.3***	0.3NS	5.2***
JUICINESS	56.3AB	59.8A	53.6B	57.7AB	58.6A	59.4A	56.0AB	4.1**	86.3***	0.8NS	4.1***
FLAVOR	63.9	65.6	63.8	64.8	65.5	64.0	64.2	0.9NS	2.4NS	1.3NS	1.9NS
OVERALL	57.4ab	59.4a	55.4b	59.0a	57.3ab	59.2a	55.3b	2.6NS	40.8***	1.7NS	5.9***

Means in row with same higher case letter not differ (P>0.01).
Means in row with same lower case letter not differ (P>0.05).

Treatments were compared using analysis of variance.

Three factors were considered in the first analysis: diet, breed and ultimate pH. Main effec... of the three factors were estimated, as well as all interactions among these factors. Only t... data as main effects with these significant interactions are presented. Breed, pH and sire neste... to breed effects and the significant sire by pH interaction were considered in a second analysis

RESULTS AND DISCUSSION

Bulls fed with lucerne hay supplemented with 2 kg concentrate and finishing period had lower score for tenderness (P<0.05) and juiciness (P<0.01) than animals fed with maize silage

Table 2 Palatability traits by ultimate pH

pH	<6.0	6-6.5	>6.5	F
No. bulls	51	31	25	
No. samples	1136	712	352	133.2***
TENDERNESS	51.4C	60.7B	69.0A	86.2***
JUICINESS	53.2C	61.0B	64.0A	2.3NS
FLAVOR	64.4	64.2	66.2	40.9***
OVERALL	54.7B	61.2A	61.0A	

Means in row with same higher case letter ... differ (P>0.01).

lemented with 2 or 4 kg of concentrate and finishing period before slaughter, or than bulls with lucerne hay supplemented with 4 kg concentrate with finishing period (Table 1). rmediate score for tenderness and juiciness showed animals fed with concentrates or with 4 upplemented forage without finishing period. Flavor was not influenced by diet. Animals fed different amounts of concentrates had an uneven overall appreciation. Increasing tenderness juiciness ($P<0.001$) were recorded as the ultimate pH increases from <6.0 to >6.5. Lower all ($P<0.01$) was recorded when ultimate pH was lower than 6.0 however, no difference was d on flavor within groups of ultimate pH (Table 2).

by pH interaction (Fig.1) showed that when ultimate pH <6.0 meat from animals fed with ge supplemented with 2 kg of concentrate and finishing period before slaughter, tended to have wer sensory scores for tenderness, juiciness, flavor and overall, but when pH increases from to 6.5 the sensory scores values increased and differences owing to the diet tend to be less ificant. These results suggest that with normal ultimate pH (no stressed bulls) change on entrate percentage of the diet along over the fattening period to low supplementation hay s could reduce some sensory traits, but when ultimate pH of meat is higher than 6.0 the tability characteristics will be determinated mainly by DFD meat characteristics.

ck et al., (1987) identified fifty-three compounds in the volatiles of subcutaneous fat, that s of them could be correlated with "grassy flavor". However, flavor was not influenced by any tment in this work, the difficulty to taste muscle devoid of fat by panellists could explain lower discriminating capacity.

ed did not affect sensory el traits. No genetic ferences have been found ween Pirenaico and Brown s, according to studies on blood biochemical polimorphisms (Tejedor et al., 1986, Zaragoza al. 1989), this data confirms our finding on similarities for sensory traits between these nds, and the great individual variability. The possible use of ultimate pH as predictor for e tenderness regardless of breed (Jeremiah et al., 1991) could be agreed upon with the breeds this study.

Table 3 Palatability traits by breed, pH and sire. Means by breed

Breed	Brown S.	Pirenaico	pH	Breed	Sire(B)	pHxSire(B)
Tenderness	58.6	58.2	78.9***	0.2NS	5.5***	4.1***
Juiciness	57.9	58.5	61.9***	0.0NS	2.9***	1.9*
Flavor	64.8	65.5	2.4NS	1.9NS	2.0*	1.8*
Overall	58.8	58.0	31.2***	4.3*	2.0*	2.7**

e affected the mean score for tenderness and juiciness ($P<0.001$), however flavor and overall reciation ($P<0.05$) were less influenced. Sire by pH interaction was significant for tenderness 0.001), juiciness, flavor ($P<0.05$) and overall ($P<0.01$). These results show that sire has more ect on the individual aptitude against stress and improves palatability of meat than the breed g.

NCLUSION

e results of this study indicate that the effect of ultimate pH on meat palatability was greater n diet, breed or sire effects. The interaction of pH and diet suggests that meat palatability ld be influenced by diet when pH is lower than 6.0 but this effect tends to disappear when pH greater than 6.0 and then meat presents DFD palatability attributes. In this work flavor was influenced by any treatment. There was no evidence on meat palatability differences between

Brown Swiss and Pirenaico bulls. Sire effect suggested the likely importance of selected bu
for improving de meat quality and having the capacity to react to stress.

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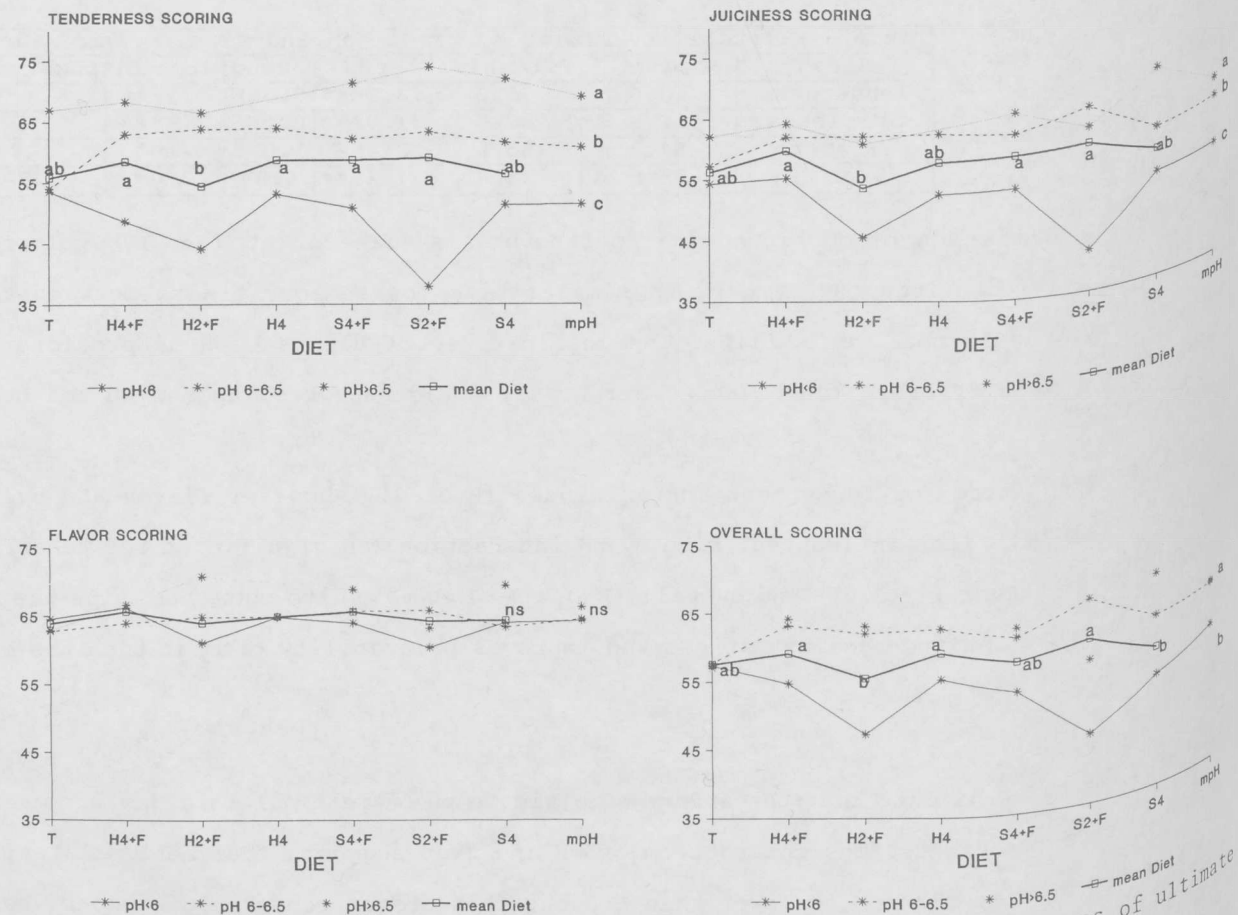

Figure 1. Tenderness, juiciness, flavor and overall by diet and by groups of ultimate pH.