

EFFECT OF FINISHING DIET ON CONSUMER ACCEPTABILITY OF URUGUAYAN BEEF IN THE EUROPEAN MARKET

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Introduction

Uruguay is currently focused on becoming more competitive in the world beef market through increasing beef production and quality according to market needs with concentrated efforts in high value markets. Although beef cattle production systems are based on pasture feeding, Uruguayan livestock producers have been investing on improved pastures and supplementation with concentrate leading to cattle with different carcass and meat quality attributes. It is important to understand consumer preferences for the different beef characteristics to develop marketing or branding strategies. Umberger *et al.* (2002) showed that consumers could differentiate between the flavour of steaks when comparing US corn-fed vs. international grass-fed beef, suggesting that country-of-origin labelling as well as niche marketing may need to be considered to provide consumers with a consistent beef product that meets their palatability expectations. The aim of this study was to evaluate the effect of the inclusion of different levels of concentrate on a pasture feeding system on consumer acceptability of Uruguayan beef assessed in four European countries.

Materials and Methods

Eighty Hereford steers, initially reared on pasture, were finished on one of the following diets with increasing amounts of concentrate: A) pasture (4% of animal live weight), B) pasture (3% LW) and concentrate (0.6% LW), C) pasture (3% LW) and concentrate (1.2% LW), and D) concentrate plus hay (*ad libitum*). The *Longissimus lumborum* muscle was removed at 24 h post mortem and cut into four 6-cm thick pieces between the L1-L5 vertebrae corresponding to samples evaluated in Germany (DE), France (FR), United Kingdom (UK) and Spain (ES). Samples were vacuum packaged, aged at 4°C for 20 d, frozen and shipped to DE, FR, UK and ES for consumer sensory evaluation. Samples were thawed at 4°C for 24 h, cut into 2-cm thick steaks, and cooked in a contact grill pre-heated to 200°C until final internal temperature of 72°C (65°C in FR). Steaks were trimmed of external fat and connective tissue, cut into 2x2x2 cm samples, wrapped individually in coded aluminum foil and kept warm in a heater until tasting. Twenty sensory sessions were conducted in each country with 10 consumers per session. Each consumer rated overall acceptability, tenderness and flavour acceptability using 8-point category scales (1: dislike extremely to 8: like extremely). Contingency table of demographic data (Table 1) was generated using the FREQ procedure of SAS (SAS Inst. Inc., Cary, NC). Overall, tenderness and flavour acceptability data were analyzed using the MIXED procedure of SAS. The statistical model included beef type as a fixed effect, consumer as random, and session as a block effect. Mean separation was carried out using the Tukey test.

Table1: Consumer demographic data (%).

Country	n	Gender		Age				Level of education		
		Male	Female	18-25	26-40	41-60	61-75	Primary School	Secondary School	University
ES	200	48.0	52.0	17.0	33.5	33.0	16.5	29.5	28.4	42.1
FR	200	49.0	51.0	14.5	31.5	34.5	19.5	19.0	36.4	44.6
DE	200	46.5	53.5	23.0	26.5	30.0	20.5	53.5	28.0	18.5
UK	186	43.8	56.2	16.2	22.2	45.9	15.7	0.0	37.0	63.0

Results and Discussion

Overall, tenderness and flavour acceptability scores of Uruguayan beef from 4 production systems evaluated by Spanish, French, German and British consumers are presented in Figure 1. Overall acceptability by ES consumers was higher for B and C compared with D, while A did not differ from B, C or D. Tenderness acceptability of A, B and C was higher than D. There were no differences in flavour scores among treatments for ES consumers. Overall, tenderness and flavour acceptability scores were higher for pasture-based diets (A, B and C) compared with the concentrate-based diet (D) when evaluated by FR consumers. Overall acceptability of C

was higher than A and D as rated by DE consumers. There were no differences between B and C or among A, B and D treatments in overall acceptability. Tenderness acceptability was higher for C compared with A, while A, B and D and B, C and D did not differ ($P>0.05$). Flavour scores were higher for C compared with A and D, and for B relative to A for DE consumers. UK consumers rated higher scores for pasture diets (A, B, and C) compared with D in overall and tenderness acceptability. Flavour scores were higher for B and C treatments than A and D which did not differ for UK consumers. Data indicates that consumers from FR and UK rated lower acceptability scores for beef from steers fed concentrate only compared with beef from pasture-fed production systems with or without concentrate feeding. Consumer preferences from Spain showed similar results when evaluating tenderness. However, flavour scores among treatments and overall scores for A and D did not differ for Spanish consumers. German consumers preferred beef from steers supplemented with concentrate on pasture compared with beef from steers fed pasture or concentrate only. Oliver *et al.* (2006) evaluated the eating quality of Uruguayan beef compared with beef produced in DE, ES and UK. German, Spanish and British consumers did not prefer the same type of beef within the same country, suggesting that individual preferences could lead to market segmentation based on taste preferences.

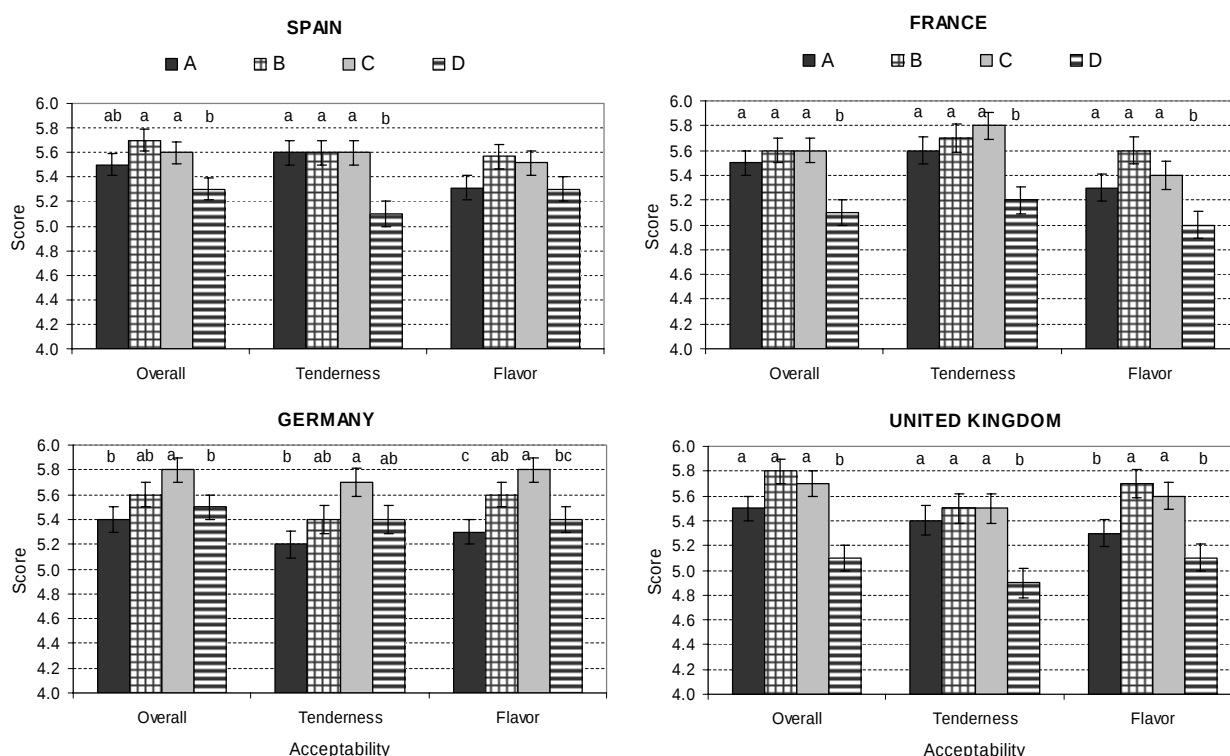


Figure 1: Overall, tenderness and flavour acceptability scores of Uruguayan beef from 4 production systems evaluated by Spanish, French, German and British consumers. A: pasture (4% LW), B: pasture (3% LW) and concentrate (0.6% LW), C: pasture (3% LW) and concentrate (1.2% LW), and D: concentrate plus hay *ad libitum*. Means within the same attribute with different letters (a,b,c) in each country differ ($P<0.05$).

Conclusions

French and British consumers showed preference for beef from pasture-fed production systems with or without concentrate feeding. Spain showed similar results when evaluating tenderness, but flavour scores among treatments, and overall scores for beef from animals fed pasture or concentrate only did not differ. German consumers preferred beef from concentrate-supplemented steers with lower ratings for beef from steers fed only pasture or concentrate. Further data analyses will be conducted in order to identify potential consumer clusters with differentiated preferences from Uruguayan beef.

References

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