K-STATE Research and Extension

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Does Knowing Brand or USDA Grade of Beef Strip Steaks Affect Palatability for Consumers?

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Introduction

In consumers' eyes, not all beef is considered equal. In addition to USDA quality grades, close to 150 branded beef programs are approved for the segregation and marketing of beef products (USDA, 2015). This large number of product categories allows consumers to have a choice in the products they purchase. Blind sensory panel testing of beef, where consumers are not shown the brand or information about a product, has been used for many years. While important to determine palatability characteristics of beef when evaluated blind, consumers do not select, purchase, and consume beef without additional product information. Evidence suggests that branding and product labeling has an influence on consumers' decisions before having firsthand experience of the product (Levin and Gaeth, 1988). Branding products allows pieces of information to be used to form quality expectations (Steenkamp and vanTrijp, 1996) and can encourage consumers to pay a premium for the increased quality associated with a brand (Grunert et al., 2004). Moreover, previous research suggests that consumers perceive a product differently when brand information is disclosed (Allison and Uhl, 1964). Numerous studies have evaluated the economic impact of beef branding; however, no research has focused on the effect of branding on consumer perception of beef eating quality. Therefore, our objective was to determine how consumer palatability ratings of beef strip loin steaks are affected when products are identified with a brand or USDA grade.

Key words: brand, grade, palatability

Experimental Procedures

Strip loins (n=40; 8 per treatment) were selected to represent five quality levels; USDA Select, Choice, Prime, Certified Angus Beef (CAB; upper 2/3 Choice), and Select from phenotypical Angus cattle. After vacuum aging for 21 days, 1 in thick steaks were cut from the strip loins, pairing consecutively cut steaks for consumer evaluation. Steaks were vacuum packaged, frozen, and stored at -20°C for 2 months until subsequent consumer evaluation. Thawed steaks were cooked in a convection oven to an internal temperature of 160°F. Following cooking, steaks were cut into 0.5 in cubes and immediately served to consumers. Consumer panelists evaluated samples for tenderness,

juiciness, flavor liking, and overall liking on a 100 point line-scale anchored at end and mid-points. The sensory scale was 0 = not tender/juicy, dislike flavor/overall extremely; 50 = neither tough nor tender, dry nor juicy, or neither like or dislike flavor/overall; 100 = very tender/juicy, like flavor/overall extremely. Additionally, consumers rated each palatability trait as either acceptable or unacceptable. Samples were fed in two rounds—blind and non-blind testing. For blind testing, consumers were served one sample from each treatment, in a random order with treatments not disclosed. For non-blinded testing, consumers were informed of brand or USDA grade prior to serving each sample. Steaks evaluated by consumers were paired for blind and non-blind testing, allowing for minimal variation across testing rounds.

Results

During blind testing, Prime and CAB samples scored higher ($P<0.05$) than Select and Select Angus steaks for flavor and overall liking (Table 1); however, when brand or USDA grade were disclosed, Select Angus steaks were scored similar ($P>0.05$) to CAB steaks for flavor. Also, CAB was rated similar ($P>0.05$) to Choice for overall liking in blind testing; however, CAB was rated greater ($P<0.05$) than all treatments except Prime for this attribute in non-blind testing. Flavor was shown to have the largest increase ($P<0.05$) in sensory scores for Prime, CAB, and Select Angus samples (Figure 1). Select Angus samples had the largest percent increase ($P<0.05$) at 16% for flavor scores, while CAB and Prime both had increases ($P<0.05$) of 15% when USDA grade and brand was disclosed. Moreover, juiciness for CAB and Select Angus steaks were perceived to be higher ($P<0.05$) having increases of more than 14%. The overall liking for CAB, Prime, and Select Angus increased ($P<0.05$) when brand or quality grade knowledge was disclosed by 10%, 12%, and 13%, respectively. Although Prime, CAB, and Select Angus steaks received increases when brand was disclosed, Choice and Select samples did not. Choice and Select steaks received similar ($P>0.05$) ratings when USDA grade was presented to consumers before testing. This lack of increase in palatability trait scores indicates consumers considered these products to be of no better quality when USDA grade information was given, providing evidence that USDA grade-based marketing of these products to consumers has no palatability-related benefit or value.

Similar trends were observed for acceptability data when brand or USDA knowledge was disclosed to consumers (Table 2). Treatment knowledge increased ($P<0.05$) the percentage of Select Angus and Prime samples rated acceptable for flavor and Prime overall liking acceptability also increased ($P<0.05$). Additionally, more than 81% of Prime and CAB samples were rated acceptable for all four attributes when tested blind and 90% of samples were rated as acceptable when brand knowledge was given. Also, it is important to note that more than 99% of Prime samples were rated as acceptable for overall liking when grade was disclosed prior to testing. Moreover, 14% more (Figure 2) Select Angus samples were considered acceptable for flavor and 10% more Select Angus steaks were rated as acceptable for overall liking by consumers when brand was disclosed. Also, 11% more Prime steaks were deemed acceptable for flavor when information about quality grade was given. The percentage of steaks for tenderness and juiciness remained similar ($P>0.05$) for all USDA grades and brands when information about steak was given prior to consumer evaluation. No difference was likely seen due

to high acceptability ratings of steaks during blind testing as well as non-blind consumer sampling.

Implications

These results indicate brand knowledge has an effect on consumer perception of beef palatability traits. Multiple traits were rated better for Prime, CAB, and Select Angus products indicating these products received a "brand lift" in palatability when identified with the brand. However, when brand information was disclosed for Choice and Select steaks, consumers showed no increases in perception of palatability for these products.

Acknowledgments

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Table 1. Consumer (n = 112) palatability ratings[1] for blind and non-blind evaluation of strip loin steaks of five different quality levels

Quality treatment	Tenderness	Juiciness	Flavor liking	Overall liking
Blind				
Prime	73.50^{a,b}	68.36^{a,b}	66.84^{b,c}	69.24^{b}
CAB[2]	66.02^{b,c,d}	57.87^{c,d}	63.12^{c,d,e}	64.08^{b,c}
Choice	64.82^{c,d}	57.83^{c,d}	60.63^{d,e,f}	60.86^{c,d,e}
Select	61.92^{e,d}	55.64^{d}	55.10^{f}	55.82^{e}
Select Angus	58.48^{e,d}	54.55^{d}	56.95^{f}	56.64^{e}
Non-Blind				
Prime	77.75^{a}	74.12^{a}	74.45^{a}	76.41^{a}
CAB[2]	69.90^{b,c}	64.58^{b,c}	71.28^{a,b}	69.92^{b}
Choice	60.16^{e,d}	54.40^{d}	59.97^{e,f}	58.67^{c,d,e}
Select	55.75^{e}	56.79^{d}	59.39^{e,f}	57.13^{d,e}
Select Angus	59.26^{e,d}	60.70^{c,d}	65.81^{b,c,d}	63.11^{c,d}
SE[3]	3.01	2.88	2.12	2.29
P - value	< 0.01	< 0.01	< 0.01	< 0.01

^{a,b,c,d,e,f}Least squares means in the same column lacking a common superscript differ ($P < 0.05$).

[1]Sensory scores: 0 = not tender/juicy, dislike flavor/overall extremely; 50 = neither tough nor tender, dry nor juicy, or neither like or dislike flavor/overall; 100 = very tender/juicy, like flavor/overall extremely.

[2]Certified Angus Beef.

[3]Standard Error of the least squares means.

Table 2. Percentage of beef strip steaks from five quality levels considered acceptable for tenderness, juiciness, flavor, and overall liking by consumers (n = 112)

Quality treatment	Tenderness acceptability	Juiciness acceptability	Flavor acceptability	Overall acceptability
Blind				
Prime	98.24^{a}	92.74^{a,b}	87.36^{c,d}	92.95^{b}
CAB[1]	92.19^{a,b,c}	81.38^{c,d}	90.12^{b,c}	90.35^{b}
Choice	88.59^{b,c,d}	81.38^{c,d}	83.20^{c,d,e}	79.68^{c,d}
Select	86.69^{c,d,e}	75.75^{d}	75.03^{e}	72.26^{d}
Select Angus	76.33^{e}	74.89^{d}	72.45^{e}	70.70^{d}
Non-Blind				
Prime	95.63^{a,b}	98.23^{a}	97.59^{a}	99.13^{a}
CAB[1]	95.63^{a,b}	90.20^{b,c}	95.01^{a,b}	92.99^{b}
Choice	90.44^{b,c}	75.12^{d}	87.55^{b,c,d}	85.92^{b,c}
Select	79.88^{d,e}	75.80^{d}	80.36^{d,e}	78.55^{c,d}
Select Angus	77.73^{e}	77.41^{d}	86.56^{c,d}	80.40^{c,d}
SE[2]	4.32	4.38	5.71	4.79
P - value	< 0.01	< 0.01	< 0.01	< 0.01

^{a,b,c,d,e} Least squares means in the same column lacking a common superscript differ ($P < 0.05$).
[1]Certified Angus Beef
[2]Standard Error of the least squares means.

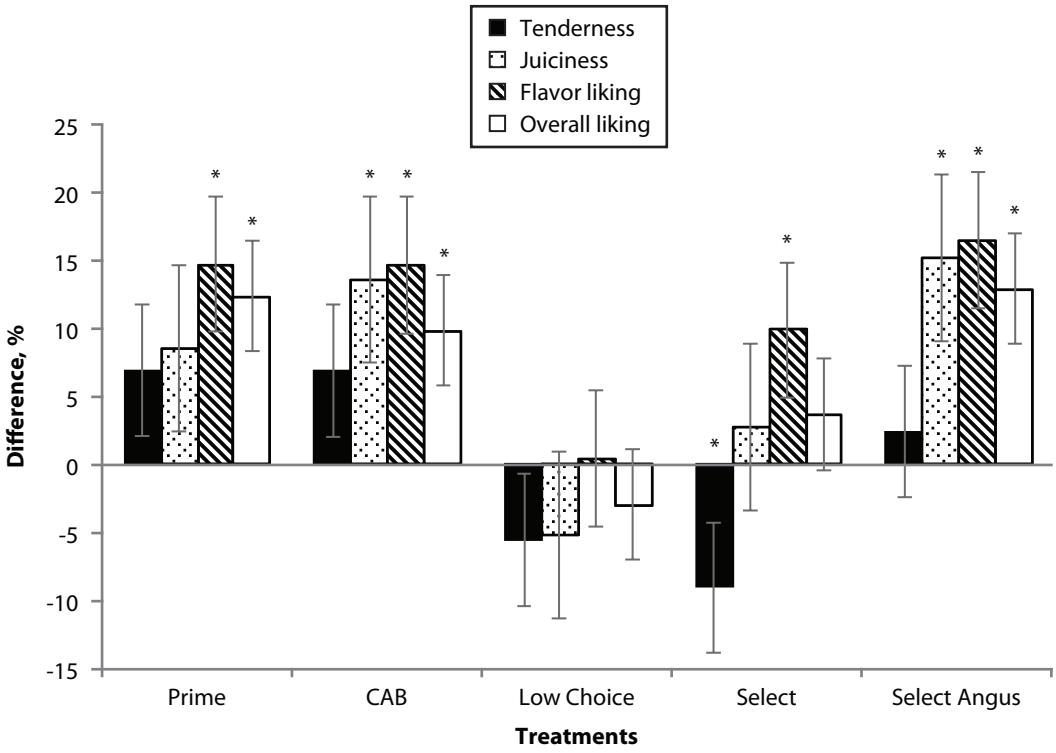

Figure 1. Percent change in consumer rating of tenderness, juiciness, flavor and overall liking when brand was identified for five quality treatments.
* Mean differs from 0 (P<0.05)

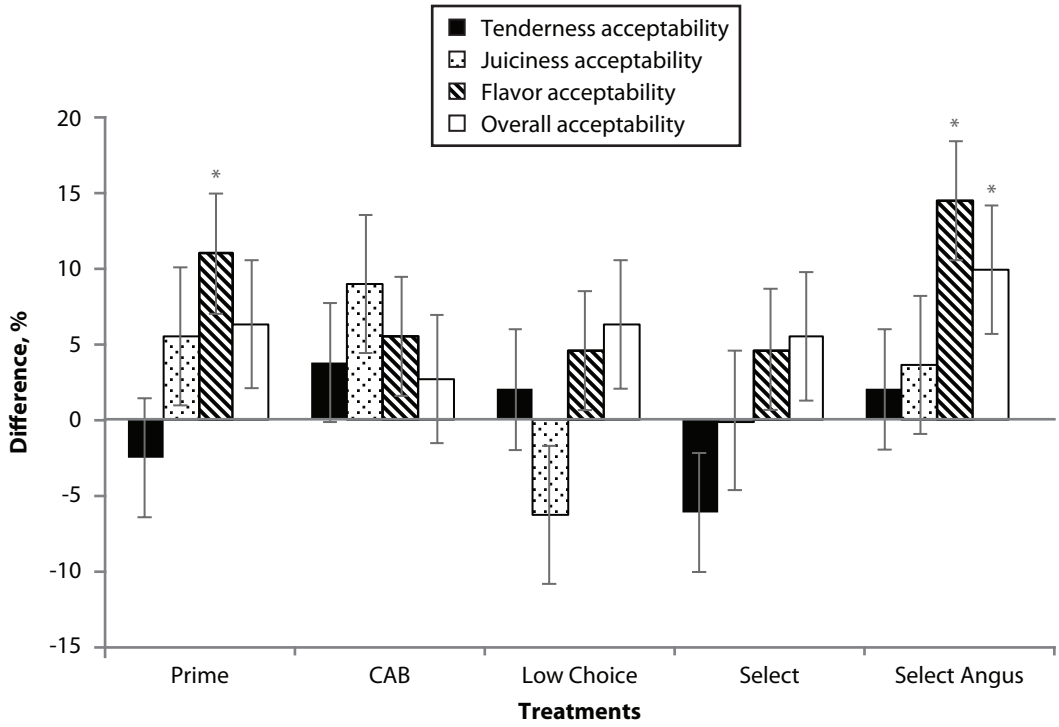

Figure 2. Differences in percentage of steaks considered acceptable for tenderness, juiciness, flavor, and overall liking by consumers when treatment was disclosed.
* Mean differs from 0 (P<0.05)