

2017 Reciprocal Meat Conference – Consumer Topics

Meat and Muscle Biology™



Consumer Triangle Sensory Test with 3 Beef Fajitas

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Keywords: beef fajita, consumer, triangle sensory test
Meat and Muscle Biology 1(3):19

doi:10.221751/rmc2017.018

Objectives

Beef fajitas are an extremely popular dish served in Mexican-themed restaurants in the US. Pre-marinated fajitas are also widely available as case-ready retail items. One fajita-producing company approached our research group about performing consumer discriminative testing to determine if 2 new proprietary fajita ingredient formulations differed from their current formulation. Therefore, the objective of this study was to determine if the current beef fajita formula differs from either of the 2 alternative beef fajita formulas.

Materials and Methods

Frozen vacuum packages of pre-processed/marinated fajitas (inside skirt steaks) were shipped to Texas Tech University. All processes/ingredient formulations are proprietary. Treatments included: treatment A beef fajita (A), treatment B beef fajita (B), and current beef fajita (C). Samples (whole muscle) were thawed overnight and cooked to a medium degree of doneness (71°C/160°F) monitored using a digital thermapen (Super-Fast Thermapen, ThermoWorks, American Fork, Utah). All samples were cooked on a clamshell grill (George Foreman) that was preheated to 375°F. After cooking, samples were sliced into 1/2" strips served warm to consumers (different sets of knives and cutting tables were used for each treatment). A triangle sensory test procedure was performed in a local supermarket in Lubbock (TX) using untrained consumers ($n = 120$).

Each consumer received 2 rounds representing each difference test (A vs. C or B vs. C), but the sampling order varied for each consumer. Round 1 was designed to determine if consumers could detect a difference between treatment A and the control (C) and round 2 was designed to determine if consumers could detect

a difference between treatment B and the control (C). Consumers were instructed to taste samples from left to right. Two were the same, and they had to determine which was the odd sample. Consumers were also asked to complete a brief demographic questionnaire.

Sensory ballots were tallied for each treatment separately to determine the number of correct and incorrect responses. Using a statistical table (pg. 433 of Meilgaard et al., 2007), we determined if consumers were able to detect a difference between the new fajitas and the original formulation. The hypothesis of "no difference" was rejected if the number of correct responses was greater than or equal to the tabled value for a 120 observations ($\alpha = 0.05$). The minimum number of correct responses required for significance was 50.

Results

Demographical information collected from the 120 consumers showed that a majority of participants eat beef either daily or weekly (24.2 and 64.2% respectively). Most participants were either Caucasian or Hispanic (59.2 and 26.7% respectively), which is very representative of the population in Lubbock, TX.

For the treatment A, 53 of 120 consumers correctly identified the sample that was different. For treatment B, 49 out of 120 consumers correctly identified the sample that was different. According to the statistical table for the critical number of correct responses in a triangle test, there was a difference ($P < 0.05$) between treatment A and C, but the consumers fail to distinguish difference between the treatment B and C.

Conclusion

According to the results, the consumers were unable to detect the difference between the current fajita formula and the treatment B.