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FOOD TESTING EXPERTS SINCE 1967

March 12, 2012

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Dear Ryan:

The following pages contain a final report for the project entitled
"Evaluation of Consumer Acceptability of Ground Beef Patties Using Consumer Panels."

We at ABC Research would like to take this opportunity to thank you and your company for your business. If you have any questions or comments, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Gillian Folkes Dagan', is written over a light blue horizontal line.

Gillian Folkes Dagan, Ph.D.
Chief Scientific Officer
ABC Research Laboratories

DATE: March 12, 2012

PREPARED FOR: BPI Technology, Inc.

CLIENT CONTACT: Ryan Dial

TITLE: Evaluation of Consumer Acceptability of Ground Beef Patties Using Consumer Panels

OBJECTIVE: The objective of this study is to evaluate consumer preferences on 3 distinct product formula classes of 72.5% lean frozen patties after two months of age.

MATERIALS AND METHODS

EXPERIMENTAL APPROACH:

A. Product:

Samples of 72.5% lean frozen patties with 4 levels of incorporation of BPI Boneless Lean Beef will be provided by the client. The levels of incorporations were 0% BPI Boneless Lean Beef, 10% BPI Boneless Lean Beef, 15% BPI Boneless Lean Beef, and 20% BPI Boneless Lean Beef. Patties will be shipped frozen and remain in frozen storage at -10F until they are cooked.

B. Sample Preparation

Ground beef patties were removed from cold storage and placed in Styrofoam coolers to maintain product temperature while they were staged for use. Staging and cooking took place in the pilot plant of the Food Science and Human Nutrition Building on the University of Florida Campus. Ground beef patties were cooked on a flat top grill for the sensory panels. Ground beef patties were then quartered before being served to panelists.

C. Sensory Evaluation

A consumer panel of 99 panelists in a randomized complete block design were used to compare incorporation levels in the 72.5% lean frozen ground beef patties. This study was conducted after two months of frozen storage on March 22, 2012. Panelists were screened using a question on consumption of ground beef. Panelists that consume ground beef at least 2 times per month were allowed to participate in the panel.

After screening, panelists were seated in private booths and samples were presented under red lighting to hide any differences in sample appearance. Panelists were asked a series of questions on each of the 4 samples. Samples were evaluated one at a time and the order in which each panelist receives the samples was randomized. A 15 cm hedonic line scale was used for panelists to rate likability:

1. Aroma of Each Sample
2. Flavor of Each Sample
3. Texture of Each Sample
4. Juiciness of Each Sample
5. Overall Acceptability of Each Sample

Panelists were also allowed to make an open-ended comment on each of the samples at the conclusion of the test. Panelists were compensated upon concluding the test on all 4 samples.

E. Statistical Analysis of Data

Panelists' ratings were averaged to create sample means for each attribute tested on each sample. The 4 incorporation levels for each product class were compared using an Analysis of Variance at the $\alpha=.05$ level. When significant differences occur between incorporation levels a Tukey's mean separation test at $\alpha=.05$ was performed, unless otherwise stated.

SUMMARY OF RESULTS

Table 1 contains all samples' average attribute ratings. For each set of samples an Analysis of Variance was performed at the alpha=.05 level and when appropriate a Tukey's mean separation was performed at alpha=.05.

% Incorporation of BLBT	Aroma	Flavor	Texture	Juiciness	Overall Acceptability
0%	9.13	8.9	8.73	8.47	9.06
10%	9.46	9.76	9.37	9.29	9.74
15%	9.58	9.43	9.49	9.14	9.75
20%	9.58	9.29	9.39	9.48	9.81

Aroma: no significant difference at alpha=.05

% Incorporation of BLBT	Mean	Mean Separation
1. 20%	9.58	a
2. 15%	9.58	a
3. 10%	9.46	a
4. 0%	9.13	a

Flavor: significant different at alpha=.05

% Incorporation of BLBT	Mean	Mean Separation
1. 10%	9.76	a
2. 15%	9.43	ab
3. 20%	9.29	ab
4. 0%	8.9	b

Texture: significant difference at alpha=.05 (Tukey's calculated at alpha=.10)

% Incorporation of BLBT	Mean	Mean Separation
1. 15%	9.49	a
2. 20%	9.39	ab
3. 10%	9.37	ab
4. 0%	8.73	a

Juiciness: significant difference at alpha=.05

% Incorporation of BLBT	Mean	Mean Separation
1. 20%	9.48	a
2. 10%	9.29	a
3. 15%	9.14	ab
4. 0%	8.47	b

Overall Acceptability: significant difference at alpha=.05

% Incorporation of BLBT	Mean	Mean Separation
1. 20%	9.81	a
2. 15%	9.75	ab
3. 10%	9.74	ab
4. 0%	9.06	b

Panelists' comments have also been included in a separate file sent with this final report.

If you have any questions, please do not hesitate to contact me at your convenience.

Prepared by:



Gillian Folkes Dagan, Ph.D.
Chief Scientific Officer
ABC Research Laboratories