

Mushrooms & Health
SUMMIT



Using Mushrooms to Improve the Nutrition Properties and Consumer Appeal of Popular Meat-based Dishes



Principal Investigators

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Research Funders

Mushroom Council and Australian Mushroom Growers Association





Research Hypothesis

- Because of their flavor-enhancing *umami* properties, mushrooms can be used as a healthy substitute for meat and a mitigating agent for sodium reduction without loss of overall flavor and/or reduction in sensory acceptability.
- 



What effect does cooking technique have on the flavor of mushrooms?

Sensory Evaluation: Descriptive Analysis

- 13 trained sensory panelists described the sensory attributes of four mushrooms cooked in various ways.
 - Steamed
 - Sautéed
 - Seared
 - Oven-roasted





Chef
TAMU

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Sensory Attributes of Cooked Mushrooms

- Overall aroma
 - Overall flavor
 - Raw mushroom
 - Moss/wet soil
 - Earthy
 - Nutty
 - Buttery
 - Yeasty
 - Rancid/stale oil
 - Smoky
 - Caramelized
 - Burnt/charred
 - Toasted/roasted
 - Cardboard/paper
 - Salty
 - *Umami*
 - Bitter
 - Sour
 - Sweet
 - Astringent
 - Oily/Greasy
 - Moist/juicy
 - Chewy
 - Crispy/Crunchy
 - Soft-hard
 - Rubbery/spongy
- 

**The Maillard Reaction Increases Umami Properties
and Enhances Flavor and Aroma**

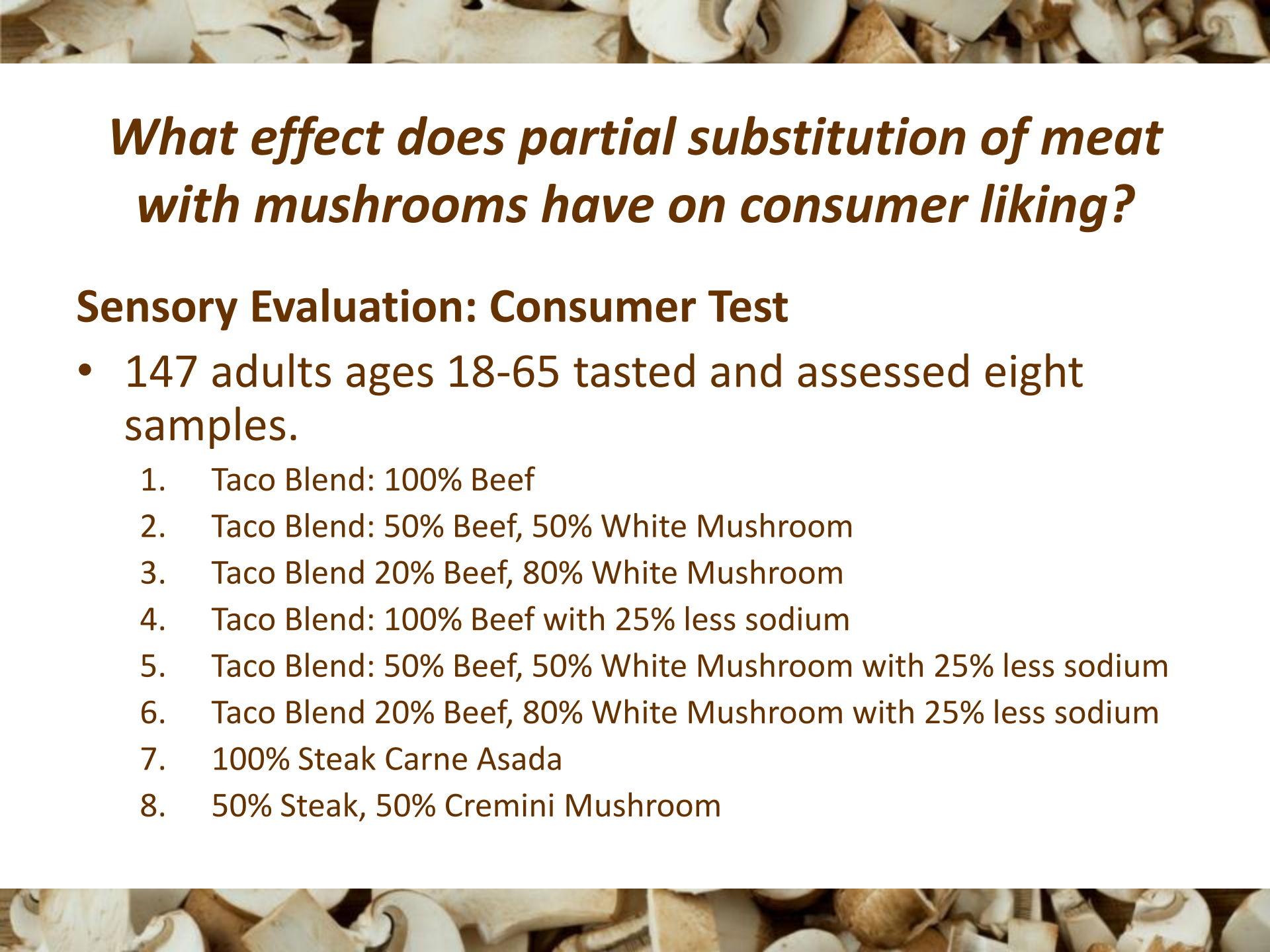


Searred Mushrooms



Sautéed Mushrooms





What effect does partial substitution of meat with mushrooms have on consumer liking?

Sensory Evaluation: Consumer Test

- 147 adults ages 18-65 tasted and assessed eight samples.
 1. Taco Blend: 100% Beef
 2. Taco Blend: 50% Beef, 50% White Mushroom
 3. Taco Blend 20% Beef, 80% White Mushroom
 4. Taco Blend: 100% Beef with 25% less sodium
 5. Taco Blend: 50% Beef, 50% White Mushroom with 25% less sodium
 6. Taco Blend 20% Beef, 80% White Mushroom with 25% less sodium
 7. 100% Steak Carne Asada
 8. 50% Steak, 50% Cremini Mushroom







TASTING EXERCISE

Sample #1

100% Ground Beef Taco Blend





TASTING EXERCISE

Sample #2

50% Ground Beef, 50% White
Mushroom Taco Blend





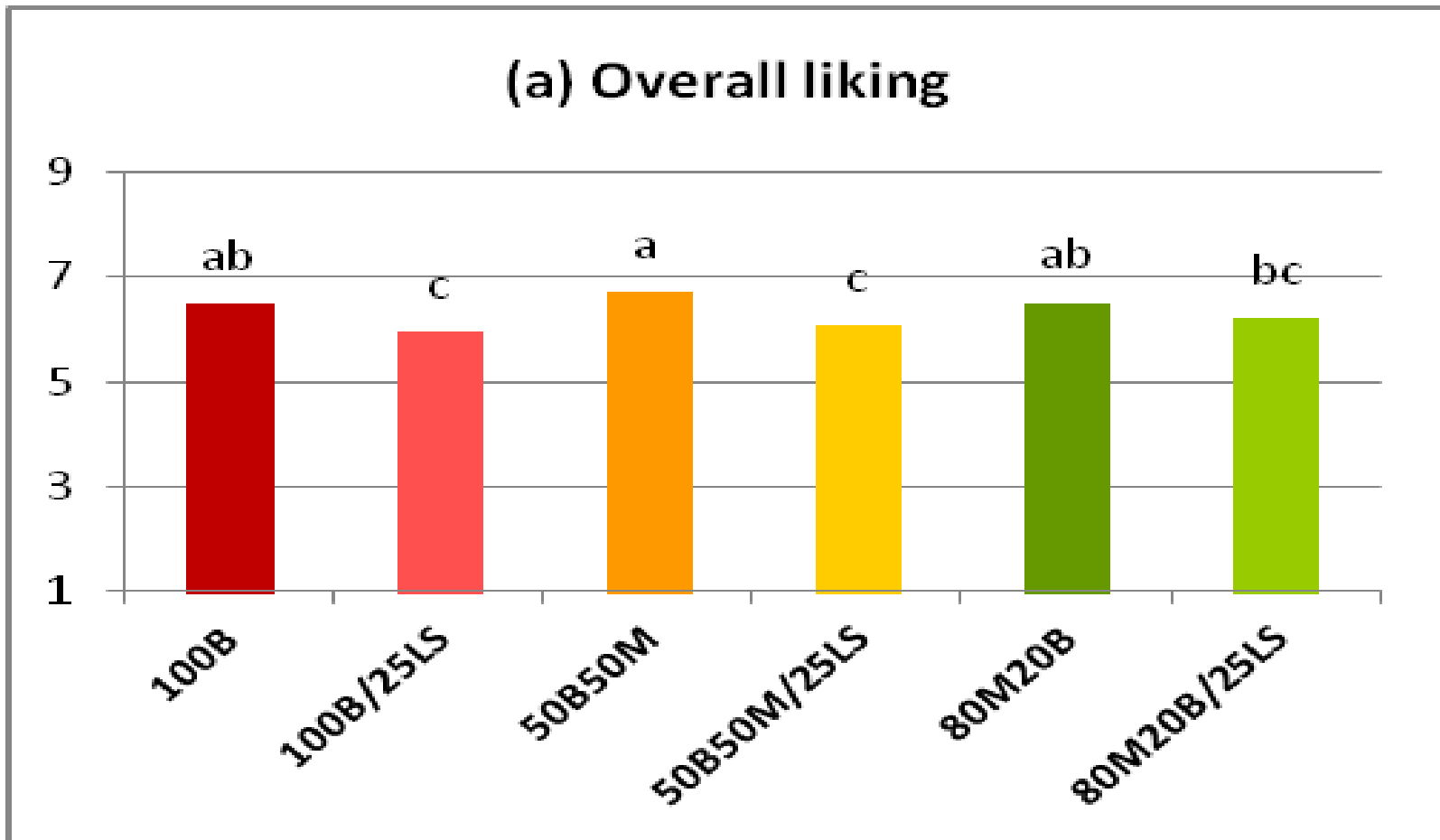
TASTING EXERCISE

Sample #3

50% Ground Beef, 50% White
Mushroom Taco Blend *with 25% less
sodium*

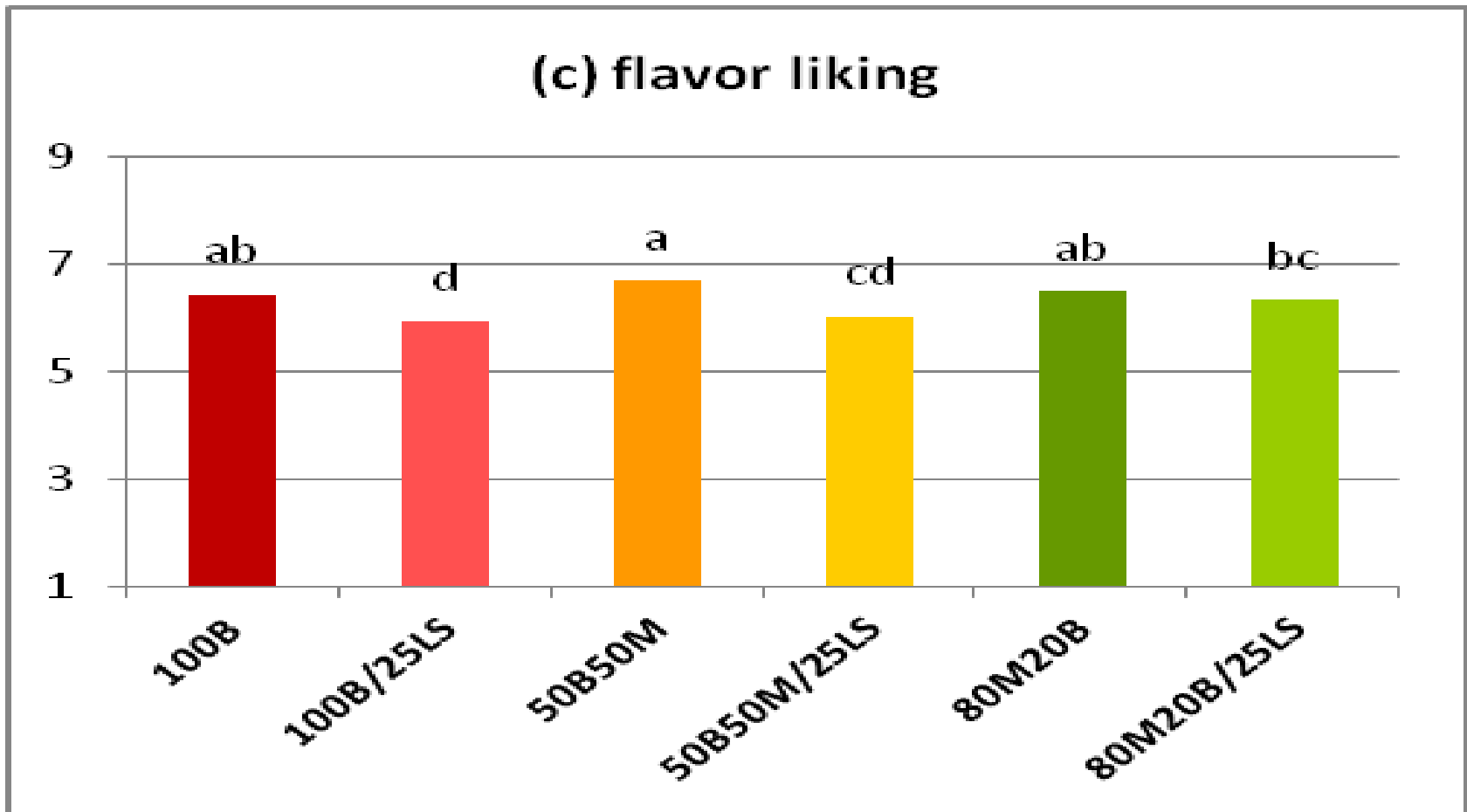


Consumer Acceptance



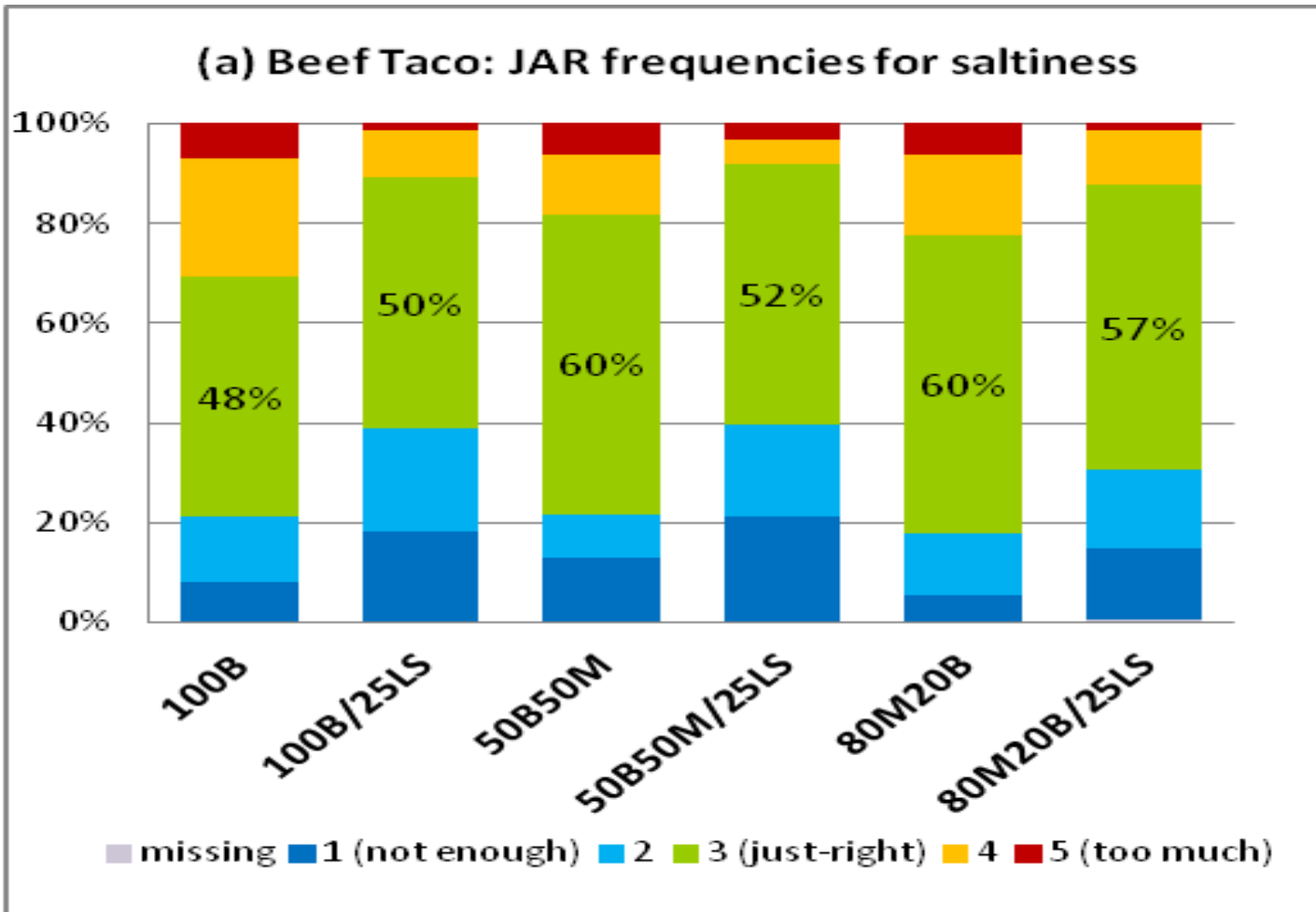
Guinard and Myrdal Miller. Unpublished data.

Consumer Acceptance



Guinard and Myrdal Miller. Unpublished data.

Just About Right Scores



Guinard and Myrdal Miller. Unpublished data.

What factors best describe a consumer who will like a meat-mushroom blend?


- Educated
- Upper income
- Gen Y/Millennial
- Female
- “Foodie”





Taco Blend Nutrition Data

RECIPE	Calories	Total Fat (g)	Sat Fat (g)	Mono Fat (g)	Poly Fat (g)	Chol (mg)	Carb (g)	Fiber (g)	Protein (g)	Sodium (mg)
100% Beef	103	5.3	1.4	2.7	0.9	32	2.9	0.7	11	334
50% Beef, 50% Mushroom	85	5.2	0.9	2.9	1.2	16	4	1	6.8	320
50% Beef, 50% Mushroom <i>with 25% less sodium</i>	86	5.2	0.9	2.9	1.2	16	4	1	6.8	238





Food Cost Data

Recipe	Cost/Recipe	Cost/2 oz. Serving
100% Ground Beef	\$13.19	\$0.53
50% Mushrooms/50% Ground Beef	\$10.57	\$0.42
80% Mushrooms/20% Ground Beef	\$8.99	\$0.36





Summary of Key Findings

- Cooking technique influences the flavor and *umami* properties of mushrooms.
- Consumers generally like mushrooms as a partial substitution for ground beef because mushrooms enhance the aroma, flavor, and texture of the finished dish.
- Reducing sodium by 25% impacts consumer liking of meat-mushroom blends.
- Educated, upper income Millennial women who like to cook are most likely to like meat-mushroom blends.
- Foodservice operators as well as home cooks can reduce food cost and improve the nutrient profile of meat-containing recipes by substituting part of the meat with mushrooms.



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