



**The Hot Beef Sundae:
HACCP-based
recipe
standardization
and product
acceptance**

BEEF Iowa Beef Industry Council

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Genesis of a new school menu item

In the summer of 2006, over 23,000 Hot Beef Sundaes were sold at the Iowa State Fair.

Beef producers involved with school meals program thought hmm... would this be a hit with students?

And so, the project began...

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State Fair Promotion



HOT BEEF Sundae
A New Twist to an Old Favorite

Delicious, easy to eat. Hot Beef Sundaes? A bowl filled with two ounces of hand-sliced, bone-in style chuck roast, topped with a generous amount of shredded cheddar cheese, topped with a generous amount of shredded cheddar cheese, topped with a generous amount of shredded cheddar cheese...

BEEF. IT'S WHAT'S FOR DINNER.

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Reimbursable School Lunch



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Collaboration

Iowa Beef Industry Council (Michelle Baumhover)
+
Iowa State University Extension (Hotel, Restaurant and Institution Management – Catherine Strohhahn)
+
Starmont School District and Director (Sue Burrack)
Public school district Grades K-12
Nutritional review as part of SMI
+
Five pilot school districts and directors:
Three public Grades K-12, one public Grades 9-12, and one private K-6

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Acknowledgements

Test Site Foodservice Directors:
Candy Anderson
Donna Becker
Sue Burrack
Judy Roberts
Diana Weber

Photos by Michelle Baumhover

Statistical Analysis by Paola Paez, doctoral student in Foodservice and Lodging Management, ISU

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Profile of Participating Districts

- Innovative Directors and enthusiastic foodservice staff
- Supportive teachers and school staff
- Districts ranged enrollment about 200 to 1500+
- One cafeteria used for each grade category
- Pilot districts in expanded Central Iowa area
- Meals prepared, served on-site and/or transported
- Generally choice of two entrees at high schools
- Limited diversity districts except for one (40% Hispanic)
- Free and reduced none to 61%
- All familiar with HACCP – three had participated USDA project
- All familiar with ISU – all participated in some type ISU project



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What we wanted to determine

1. **Develop and Standardize a Recipe**
 - HACCP Tips and CCPs
 - Versatile (use of various product brands, purchase forms, equipment, and portion sizes)
 - Would meet qualifications for reimbursable meal
2. **Assess Menu Item Acceptance – Students and Staff**
 - Paper/Pencil Assessments (with incentives)
 - Plate Waste
3. **Determine Food Cost**
4. **Identify Labor Time – preparation and service**
5. **Conduct nutritional analysis**



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Data Collection

- Project protocol and data collection instruments approved by ISU Institutional Review Board
- Trials took place between November 2006 – March 2007.
- All days of data collection were very cold and/or windy.
- Information packet sent prior to test date including promotion flyer with drawing notices
- Directors obtained superintendent approval and returned participation agreement
- Information sent to directors including recipe, interview questions, other data collection instruments, and request to track approximate time to prepare menu item.



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Standardization of HACCP-based Recipe

- Recipe adapted from State Fair based on USDA portion size guidelines – quantity = 100 servings
- Followed guidelines of NFSMI and USDA (*Measuring Success with Standardized Recipes, 2002*)
- Recipe procedure tested with small batch at Starmont
- Recipe sent to Directors prior to trial date
- Structured interview conducted each director and head cook regarding products, costs, ease in preparation and service
- Testing –5 districts in 8 cafeterias (elementary and/or high school)
- Final Test on ISU Campus Tearoom



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Students in Quantity Food Production Laboratory at ISU Dishing the HBS



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Recipe Standardization, cont



- Meal reimbursement qualification based on USDA guidelines for lunch with traditional food-based menu planning with minimum requirements:

Grades K-3

Meat/meat alternate = 1 1/2oz
Grains/bread = 1 serving per day
Vegetables/Fruit = 2 items offered each lunch 1/2 cup/svg.
Milk = 8 fluid oz.

Grades 4 - 12

Meat/meat alternate = 2 oz
Grains = 1 serving per day
Vegetables/Fruit = 3/4 cup per day
Milk = 8 fluid oz.

- Offer versus Serve – student must be offered all 5 items but may decline 2 of 5



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Menu Item Acceptance - Assessment



- Paper/pencil survey
 - Color coded by groups: blue, yellow and pink
 - 6 questions: likeability, repeat, gender, grade and what did you like/not like about the HBS
 - Tear-off slip for prize drawing
 - Approved by Institutional Review Board



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Assessment procedure



- Given to students who selected the Hot Beef Sundae
- Collected in special box by tray return window
- Prizes drawn after meal service – one per district:
 - Game Boy for Grades K-5
 - iPod for Grades 6 – 12
 - Beef Certificates for Staff



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Some assistance younger kids



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Table by tray return for MS/HS



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Who Participated?

Grade

- K-5 Level: 775 respondents
- K6-K12 Grade: 712 respondents
- Total: 1,487 students/ 3722 population



Teachers and Staff

- 99 respondents



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Data Analysis

- *Statistical Package for the Social Sciences* program was used
- Frequencies and means each item were calculated
- Tallies were made of responses by grade group or staff.
- Oneway ANOVA was run to determine if significant differences existed between grade groups or by gender
- Two open-ended questions (What did you like and not like about the HBS) were reviewed with classification of responses into categories, such as specific ingredients or flavor, texture or temperature.

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Gender of Respondents

Category	Gender	
	Male (N)	Female (N)
K-5 Grades	389	386
K6-K12 Grades	396	316
Teachers and Staff	27	72



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How well did they like the Hot Beef Sundae?*

Category	Mean
K-5 Grades	4.44
K6-K12 Grades	4.32
Teachers and Staff	4.59
Overall	4.40

* A 5-point Likert-type Scale was used
1 = Not at All, 5 Frown Faces and 5 = Great and 5 Happy Faces ☺



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How willing are they to choose the sundae next time on the menu?*

Category	Mean
K-5 Grades	4.36
K6-K12 Grades	4.12
Teachers and Staff	4.47
Overall	4.26

* 5 point scale with 1 = No Way; 5 = Definitely



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Significant Differences

- No significant differences were found between responses given by boys or girls. *Gender was not a factor in acceptance of product.*
- Significant differences at .05 level were found between grade groups of students in how well they liked the HBS, with *students in grades K-5 expressing higher acceptance.*
- Grades 6-12 were *significantly less willing to choose the HBS next time* was on the menu (.000 level)
- *Bottom line: Grades K-5 liked the product better expressed greater willingness to select again.*



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Common things all students liked about the Hot Beef Sundae*

- Taste
- Ingredients
 - Potatoes
 - Beef
 - Cheese
- Combination of Flavors



*themes open ended questions

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Common things they did NOT like about the Hot Beef Sundae

- Ingredients
 - Potatoes
 - Cheese
 - Gravy
 - Tomatoes



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Menu Item Acceptance: Plate Waste

1. One researcher
2. Stationed by trash containers near tray return window
3. Standardized form used:
 - codes for district and building
 - time period of observation – meal periods
 - note portion size of ingredients by grade levels
 - estimates of product remaining and ingredients
 - no product
 - ¼ or less of portion
 - ¼ to ½ of portion
 - ½ or more of portion



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Plate Waste Observations

Amount remaining	Number (%)
No product	578 (45%)
¼ or less	205 (16%)
¼ to ½	237 (19%)
½ or more	251 (20%)

Total 1,269



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Plate Waste by Grade Levels*

	K-5 N=156	6-12 N=661
No Product	58 (37%)	369 (56%)
¼ or less	40 (26%)	107 (16%)
¼ to ½	31 (20%)	124 (19%)
½ or more	27 (17%)	61 (9%)

* Not all observations categorized by grade



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Food Cost of Ingredients

- Beef, cooked and shredded
- Instant Potatoes
- Gravy Mix
- Shredded Cheese
- Cherry or Grape Tomato
- Disposable Serving Bowl

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Beef Ingredients Used

Canned product = average of \$.47/serving


- Used 3 of 5 sites
- Cost per can \$12.96 to \$16.33
- Drained weight 4 lb. to 5 lb.
- Easy to break into smaller pieces to ensure distribution throughout gravy (use of gloved hands)


Commodity raw roast (\$2.29 lb., cooked day before, cooled and chopped in VCM with pre-cooked roast at cost of \$1.38 lb.) = \$.44/serving


Commodity ground beef crumble = \$.18/serving

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Gravy Mix

- Four brands used
- Yield per packet ranged from one ½ to one gallon.
- Costs ranged from \$ 2.23per packet (yield of ½ gallon) to \$3.55 per packet (yield of 1 gallon)
- Cost per serving ranged from \$.06 to \$.15
- 1 site prepared gravy from beef roast drippings

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Slide of three gravy mixes








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Instant Potatoes

- Four brands used – canned and bagged
- Costs ranged from \$3 to \$4 per bag Pearls (yield 40 ½ cup servings per bag)
- Cost per ½ cup serving average of \$.09
- Average cost per ¾ cup serving: \$.13



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Slide of three brands bagged in potato mixes






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Shredded Cheese

- All five sites purchased in shredded form
- Two sites used commodity product
- Price per lb ranged from \$1.89 to \$1.97
- Average cost 1/2 oz servings = \$.06






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Tomato



- Cherry and Grape tomatoes used
- Ingredient with widest range of price
 - Grape = \$1.53 per pint to \$2.99
 - Cherry = \$.94 per pint to \$1.65
- Size of each tomato varied – some cut in two (labor estimated ½ hour for 300 servings)
- Average cost per whole tomato/serving ranged \$.02 to \$.07
- High plate waste




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Serving Bowl

- One of five districts used permanent ware
- Four of five purchased disposable bowls
 - One used rectangular cardboard
 - One used straight edge 10 oz. bowl – shown in photo
- Three made special purchase for this item
- Common price was about 2 cents/6 oz styrofoam bowl



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Summary of Average Serving Cost

Beef = .47
 Gravy = .05
 Potatoes (1/2 cup) = .09
 Cheese = .06
 Tomato = .05
 Bowl = .02

Total = \$.74/serving



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Preparation Time



- Two used SJK for beef and gravy heating (Step 1)
- Two completed Step 1 in 6 inch deep counter pans – assuming 50 servings per pan based on gravy yield
- Preparation time ranged from 1 hour to 3 hours
- Longer when using raw product (cooking, cooling and chopping processes)



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Under watchful eyes...



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Service Time



- Challenge as most assembled part of service
- Required reassignment of duties OR additional staff
- With 4 items, required extra service well or reconfiguration of line assembly
- Use of permanent ware bowl easier to process (one-hand could separate from stack and hold)
- Pre-portioning of potatoes and gravy by tray worked well (caution limited holding time if styrofoam bowls) with cheese and tomato added as served.
- Or, set up back line with staff to portion potatoes and beef gravy, move forward for cheese and tomato
- Average of 10 servings dished per minute



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Nutritional Analysis



- Two nutritional analyses conducted:
 - third-party
 - state reviewer
- Based on products
 - Beef crumbles 2 oz in ½ cup gravy (third party) OR
 - Canned beef (gravy in can used rather than mix)
 - ½ cup mashed potatoes (pearls)
 - ½ oz shredded cheese
 - Cherry tomato



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Third-Party Nutritional Analysis



- Per serving:
 - 355 calories
 - 17% calories from protein
 - 52% calories from fat (19% saturated fat)
 - 30% calories from carbohydrates
 - 900 mg sodium



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State Consultant Nutritional Analysis

- Review of one district
- Per serving:
 - 442 calories
 - 50% calories from protein
 - 30% calories from fat (12% saturated fat)
 - 22% calories from carbohydrates
 - 1905 mg from sodium

Product brands and forms do make a difference!



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Comments from directors



- “We did menu the Hot Beef Sundaes again because we had students at the Elementary School asking when we were going to have them. I would judge the response about the same as the last time.....about 1/3 of the High School students took that item over the alternative. There was positive response at the K-6 building but some students had a lot of plate waste.”
- “The HBS is easy to prepare but takes some additional serving time due to the 4 ingredients in the entree.”
- “Most students do not eat the tomato”
- “Very tasty entree!”



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Directors' Observations



“The kids loved it again. We had a few less for lunch than on the trial day but heard several kids say they should have bought lunch”.

“The kindergarten teacher also told me every student in her class wanted hot lunch when they found out they were having HBS!”

“Almost all students selected HBS the first offering, and over 90% the second time, even without the incentives and promotion!”



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Challenges/Observations



- Introduction of a new item
 - Personality of staff and directors appeared to make a big difference
 - Incentives were needed for encouragement to try
 - Samples could be used also
- Recipe appeared to be used as process guide and ingredient reference – not clear if HACCP tips followed. *More research needed.*
- Food Cost Data and Nutrient Analysis will vary with product forms and brands
- Overall labor costs not higher, reallocation needed
- Time intensive at service - Possible pre-portioning?
- Invest in permanent wear to reduce costs and waste?



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Take-Aways

- Hot Beef Sundae is a menu item appealing to students of all grades and staff.
- Hot Beef Sundae can fit into a food budget – use of commodity items reduces costs.
- Presence of HACCP-based recipes provides reference – future research to determine if effective in improving food safety.
- Menu Planning Considerations
 - Offer with lower labor items
 - Review staffing assignments, flexibility/cross training
 - Consider fat and sodium content of other items that week
- Consider investment in permanent ware



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Questions or Comments?



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