

## Dairy Innovations: Solutions to Achieve the 2010 Dietary Guidelines for Americans



9.25.2011



## We work for the dairy industry



## What you will hear today

- The Dairy Group and the 2010 Dietary Guidelines
- Consumer needs drive innovation and education
- Protein trends and considerations
- A closer look at sodium
- Marketplace innovations in health and wellness
- Discussion



## The Innovation Center for U.S. Dairy

Healthy People

Healthy Products

Healthy Planet



*The Innovation Center Operating Committees work to combine the collective resources of the industry to provide consumers with nutritious dairy products and foster industry innovation for healthy people, healthy products and a healthy planet*



## The Dairy Group and the New Dietary Guidelines

Carol Blindauer, MBA, RD  
SVP, Health and Wellness  
Innovation Center for U.S. Dairy



## The Dietary Guidelines (DGA) at a glance

- Based on a rigorous review of scientific evidence
- Reviewed every five years
- Updated if necessary to account for new research and knowledge about Americans' health and diet



**Key highlights of the DGA's include:**

- Maintain calorie balance to achieve healthy weight
- Focus on eating nutrient-dense foods and beverages
  - Vegetables, fruits, whole grains, fat-free or low-fat milk and milk products, seafood, lean protein and nuts and seeds more often
- Child nutrition is a national priority
  - Improve child nutrition and encourage development of good habits early



**We share a focus on child nutrition as a national priority**

**Fuel up to Play 60 is rooted in the DGA**



**Dairy foods are identified in the DGA for their role in overall health**

*“Under consumption of dairy foods in the diet may lead to an increase in cardiovascular disease and type 2 diabetes, as well as an increased risk for poor bone health and related diseases”\**

**Milk and milk products play an important role in the DGA**

DGA Recommendation	Examples of Dairy Group serving sizes; equivalent to:
<ul style="list-style-type: none"> <li>■ Increase intake of fat-free or low-fat milk &amp; milk products such as milk, yogurt, cheese or fortified soy beverages</li> <li>■ Recommended intake:                             <ul style="list-style-type: none"> <li>▪ 2 cups: children ages 2-3</li> <li>▪ 2 ½ cups: children ages 4-8 (increased ½ cup)</li> <li>▪ 3 cups: ages 9 and older</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ 1 cup of milk or yogurt</li> <li>▪ 1 ½ ounces of natural cheese</li> <li>▪ 2 ounces of processed cheese</li> <li>▪ 1 cup of fortified soy beverage</li> </ul>

**Room to close the gap between dairy recommendations and consumption**

Servings Missing	Gender/Age
2	Women 18+
1 ½	Men 18+ Girls 14-18
1	Girls 9-13
½	Boys and girls 4-8 Boys 9-13 and 14-18

**Dairy is recommended even for those with lactose intolerance**

- Lactose intolerance doesn't mean dairy avoidance
- DGA recommends low-lactose and lactose-free milk products for lactose intolerance
- USDA's definition of milk and milk products includes lactose-free and lactose-reduced products



**Especially important when you consider that dairy delivers 3 out of 4 nutrients of concern**

- Four nutrients of public health concern are highlighted in the DGA – calcium, potassium, vitamin D and dietary fiber
- Milk is the #1 food source of calcium, potassium and Vitamin D\*



**Consumer education through MyPlate shows that Dairy is an important part of every meal**

- With many options, low-fat or fat-free dairy foods can help Americans meet the Guidelines
  - Milk
  - Yogurt
  - Cheese



**DGA advice can easily be lost in a sea of information**



**Consumer needs drive innovation and education**



**People are interested in getting the most nutrients from their food choices**



**Dairy foods deliver multiple nutrients**

<b>Milk</b>	Vitamin D Calcium Phosphorus Riboflavin Niacin Vitamin B12 Protein Vitamin A Thiamine	
<b>Cheese</b>	Calcium Phosphorus Protein Vitamin D*	
<b>Yogurt</b>	Calcium Phosphorus Protein Riboflavin Potassium Vitamin D*	

**Most people don't know about dairy's nutrition**

Communicating the presence of **MULTIPLE NUTRIENTS** is critical!

Milk contains 9 essential nutrients (new "news" to the public)

Beyond calcium, the most compelling nutrients are vitamin D, **Protein**, vitamin B12 and potassium



**Your patients/clients care about health benefits**

Linking nutrients to a specific **BENEFIT** is powerful

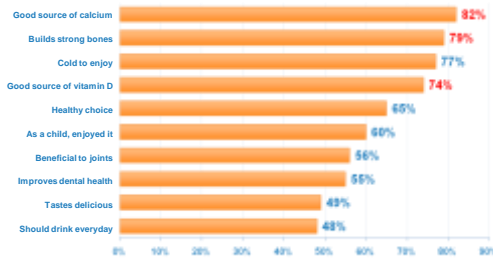
People need to be reminded of the connection between nutrients and benefits

People understand nutrients help achieve a "healthy body" and this message should be reinforced



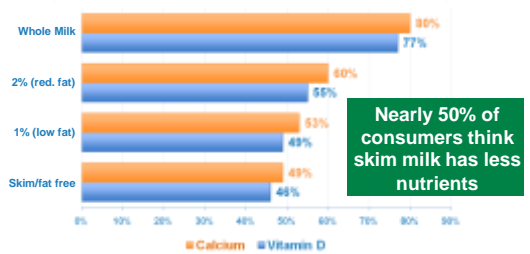
**People do understand role of milk related to calcium, vitamin D and strong bones**

**Top Milk Perceptions**  
(Aided Question: Agree Completely/Strongly)



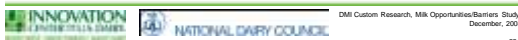
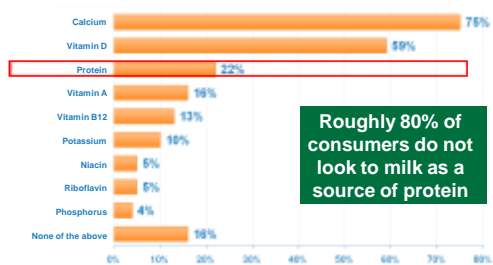
**Critical to supporting the DGA's is educating that milk's nutrients remain at all fat levels**

**Consumer Perception of Calcium and Vitamin D in Milk**



**Significant opportunity exists to educate Americans about milk's other nutrients**

**Nutrients Sought When Drinking Milk**



**Protein Trends and Considerations**

Loren Ward, PhD  
Director, Research and Development  
Glanbia Nutritionals



What's the consumer thinking?



Previous learnings confirm consumers are interested in protein

54%

Of consumers say they're trying to get more protein in their diet vs. a year ago, slightly more than in previous years\*



26%

Say they're actually consuming more protein than 2 years ago\*\*



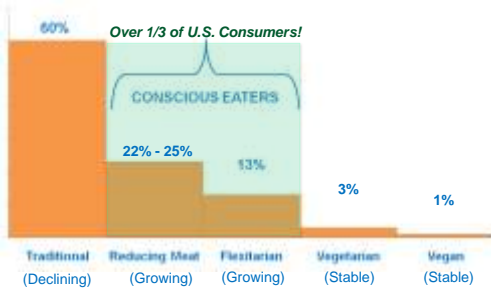
47%

Say the message "good source of protein" is very important on product labels\*\*



\* The NPD Group's Dining Monitor Service, 2008  
\*\* The 2009 Health Focus Trend Report

Eating less meat is moving mainstream – dairy offers protein alternative



Vegetarian Times Survey 2008, Cultivate Research 2006, The Vegetarian Resource Group 2009

People are reducing meat to be more healthy and they don't refer to themselves as semi-vegetarian

How People Refer to the Practice of Eating Less Meat

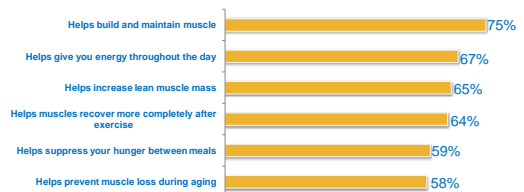
Yes	Not
Eating more healthy	Eating semi-vegetarian
Eating less meat	Eating more plant-based foods

DMI Emerging Diet Research, 2010  
Base: Adults who are reducing the amount of meat that they eat (n=345)  
Q6: Which of the following best describe how you refer to the practice of eating less meat?

Why do consumers want to increase dietary protein?



Consumers associate protein with lean muscle, energy and satiety



NOTE: These statements were selected by consumers and are not specifically approved for labeling.  
DM Why Protein Tracker, 2008  
Q2.2 Please select the potential benefits that you believe protein can provide.

**Protein recommendation vs. optimal health**

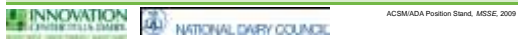
- RDA: 0.8 g/kg for adults
  - Preventing deficiencies vs. optimizing health
- Acceptable Macronutrient Distribution Range (AMDR): 10-35% total calories
- Emerging research indicates some may benefit from more
  - Active adults and athletes
  - Aging adults
  - Weight-conscious individuals



**Higher protein supported for nutrition and athletic performance**

**Position of ADA, Dietitians of Canada, and ACSM**

- Protein recommendations are increased in endurance and strength trained athletes.
  - 1.2 – 1.7 g/kg/day
- Protein consumed after exercise will provide amino acids for the building and repair of muscle tissue.



**Higher protein diets can increase satiety**

- Calorie for calorie, whey protein can help people feel fuller longer than carbohydrates or fats
- IOM Dietary Reference Intakes for Macronutrients:
  - "A number of short term studies indicate that protein intake exerts a more powerful effect on satiety than either carbohydrate or fat"



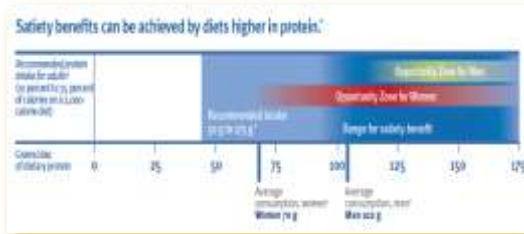
Institute of Medicine 2005  
Hahn et al. JGIM 2005



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**One way to get the benefits of a higher protein diet, is for consumers to up their intake throughout the day**

**Satiety example:**



\*Individuals respond differently; the amount of protein needed to achieve a satiety benefit will vary (based on the AMDR for a 2,000-calorie diet).  
Westerkamp-Plantinga MS et al. Annu Rev Nutr 2009; 29:21-41; Valdesol M, et al. Physiol Behav 2008; 94:300-307; Paddon-Jones D Am J Clinical Nutr 2008; 87(suppl):1568S-1562S; AMDR from Institute of Medicine Dietary Reference Intakes 2002; Fulgoni VL 3<sup>rd</sup> Am J Clin Nutr 2008; 87(5):1548-1575

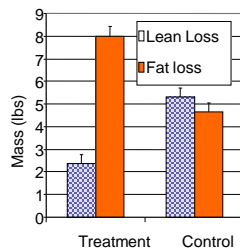


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**Healthy weight... still no magic bullet**

**Energy In – Energy Out**

- To lose weight, must expend more than consume
- **Problem:** People often don't eat to preserve muscle or bone health when losing weight
- **Solution:** Dairy proteins and milk's other nutrients can help both muscle and bone retention during healthy weight loss
- Role of satiety – dietary intervention can partition toward increased body fat utilization



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**Healthy aging**

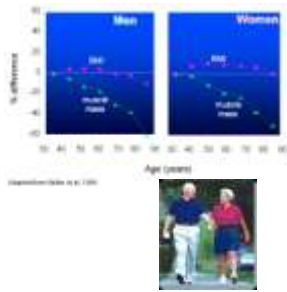


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**Healthy aging**

**Muscle preservation**

- Milk and milk proteins help slow muscle loss
- Problem:** Protein consumption also decreases with age
- Solution:** Quality of protein becomes more important with decreased intake of protein
  - Aging individuals may benefit from more specialized types of protein (fast vs. slow acting), higher leucine, etc.
- Exercise/resistance training

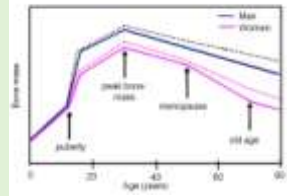


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**Healthy ageing**

**Bone Health**

- Milk's nutrients including milk proteins help prevent osteoporosis
- Maximize bone health during peak bone-building years
- Maintain bone; slow rate of loss (late 20's – early 30's)
- Nutrients other than calcium important in bone health (e.g., mg, cu, fe)
- Protein – beneficial to bones
- Vitamin D – key to absorption



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**Opportunity: Health professionals can help people add protein throughout the day**

Sample Daily Menus\*

Menu 1: Typical protein intake by meal				
17g	19g	11g	35g	1,810 Calories 82g Protein (17% of calories)
Menu 2: Higher protein intake spread throughout the day				
31g	24g	27g	35g	1,800 Calories 117g Protein (25% of calories)
Breakfast	Lunch	Snack	Dinner	



\* Innovation Center for U.S. Dairy, 2011

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**Dairy proteins offer convenient and nutritious way to increase protein intake**



Protein Synthesis



Exercise Recovery



Body Composition



Satiety



Healthy Weight



Healthy Aging



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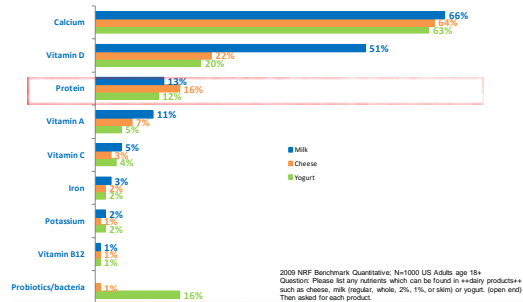
**Dairy protein is top quality**

Protein Type	Amino Acid Quality (PDCAAS)	Protein Absorption Value (Biological Value)	Net Protein Utilization	Protein Efficiency Ratio
Whey Protein	1.00	104	92	3.2
Milk	1.00	91	82	2.5
Egg	1.00	100	94	3.9
Soy Protein	1.00	74	61	2.2
Black Beans	0.75		0	0
Peanuts	0.52			1.8

Journal of Sports Science and Medicine, 2004



**Many have a lack of awareness of dairy's protein content**

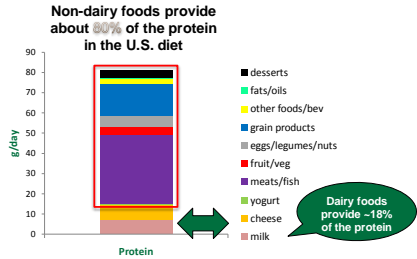


2009 NRF Benchmark Quantitative: N=1000 US Adults age 18+  
 Question: Please list any nutrients which can be found in dairy products\* such as cheese, milk (regular, whole, 2%, 1%, or skim) or yogurt. (open end) Then, asked for each product.



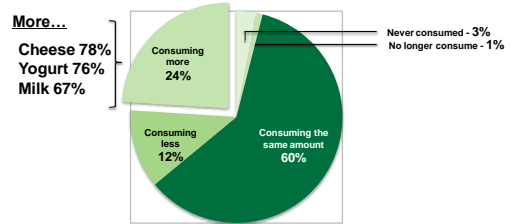
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Room for education on dairy's protein package



For those who do know about dairy's protein ...

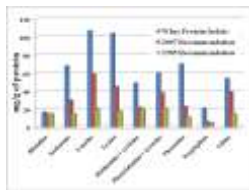
... helping reduce the gap for those reducing meat



Not all proteins created equally – milk protein provides all essential amino acids

Dairy proteins meet needs

- Milk's protein provides all essential amino acids
- Whey protein, a protein naturally found in milk, exceeds benchmark recommendations
- Some may have increased needs:
  - Sports nutrition – athletes, strength trainers
  - Aging populations



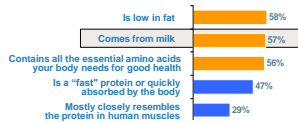
- Nitrogen balance study
  - S: NBAL = -16.8 + 24.3 (Proin)
  - NBAL = 0.69 g/kg/day
  - SA: NBAL = -71.6 + 50.9 (Proin)
  - NBAL = 1.41 g/kg/day

Whey protein – an example of increasing dairy protein



Whey protein shines when consumers are told it comes from milk

Attributes That Make People Want To Consume Whey Protein



DMI Whey Protein Tracker 2008  
Q23: Which, if any, of the following attributes of whey protein make you want to consume it?

Whey protein can help products deliver on excellent or good source of protein claim

Whey Ingredient	Amount of Whey Ingredient to Achieve	
	Excellent Source	Good Source
Whey Protein Isolate 90	11.2g or more	5.6-10.6g
Whey Protein Concentrate 80	12.5g or more	6.3-11.9g
Whey Protein Concentrate 34	29.5g or more	14.7-27.9g

An Excellent Source contains 20% or more of the Daily Value. A Good Source contains 10-19% of the Daily Value. %DV for protein is 5g based on a 2,000-calorie diet. These values apply to adults and children over age 4.

The grams per reference value amount customarily consumed (RACC) values listed are estimated amounts of the specific whey ingredient based on averages that would be needed to meet the label claim, providing the product contains no other ingredients with protein.

**Whey protein is a natural protein that comes from milk**



**A wide range of marketplace applications**



**A closer look at sodium: Role of sodium in cheese making**

Nigel Kirtley, VP  
Cheese Research, Development and Quality  
Kraft Foods  
Innovation Center Health and Wellness Committee member



**Public health concerns have spurred call for further sodium reduction**

- 2010 Dietary Guidelines
- IOM Sodium Committee
- National Sodium Reduction Initiative (NSRI)
- American Heart Association



**Sodium consumption among Americans is higher than recommended**

**2010 Dietary Guidelines for Americans\* recommends:**

- General Population - **2300 mg/day**
- Those with hypertension, diabetes or chronic kidney disease as well as African Americans and adults over **50 years of age -1500 mg/day**

**Current consumption:**

- Current average intake by Americans is **3400 mg/day**



\*U.S. Department of Health and Human Services and U.S. Department of Agriculture. Dietary Guidelines for Americans, 2010, 7th Edition, Washington, DC: U.S. Government Printing Office, January 2011.

**Sodium concerns are not unique to the U.S.**

- France, England, Australia, Canada and others have been active in public health campaigns to help their citizens reduce sodium

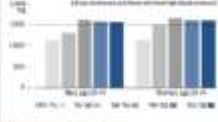


**High sodium: a public health concern**

**Less salt in the daily diet**

The government's voluntary recommendations suggest reducing the average amount of sodium consumed from 3,400 milligrams in 2000. Most of the sodium in our diets comes from packaged and processed foods.

**Mean daily sodium intake (mg) from food**



**Where the sodium comes from**

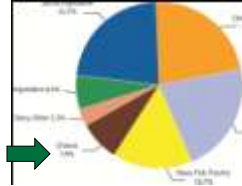


**Cheese's contribution to sodium intakes in U.S. diet**

Sources of average sodium in the U.S. diet by food groups:  
**Cheese contribution is 7.8%\***

**Cheese also contributes\*\***

- 21 % of dietary calcium
- 11 % of phosphorus
- 9 % of protein
- 9 % of vitamin A
- 8 % of zinc



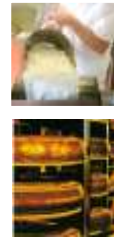
\*Hertsgen E. Sources of sodium in the food supply. Paper presented at Institute of Medicine, Committee on Strategies to Reduce Sodium Intake, Information-Gathering Workshop, 2009, Washington, D.C.  
 \*\*Note: Data from only 1 of the NINDDS 30-year dietary recall (at 2000). Individual food items in these charts are included with their respective food groups (e.g., for pizza, the crust is categorized as grain, the cheese as cheese, tomato sauce as vegetable, etc.).  
 \*\*Data Research Institute, NINDDS 2005-2006, April 24 press. Data Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey. Hyattsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, (2003-2004, 2005-2006). (http://www.cdc.gov/nchs/nhanes.htm)

**The role of salt in the cheese making process**



**Salt plays a critical role in cheese making**

- Manufacturing process
- Flavor and texture
- Quality and functionality
- Shelf-life
- Safety



Guinee TP. Salting and the Role of Salt in Cheese. International Journal of Dairy Technology, 2004; 57:99-109

**How is cheese made?**

- Natural cheese
  - Made from four basic ingredients
    - Milk
    - Salt
    - Starter culture
    - Rennet



**How is cheese made?**

- Processed cheese
  - Made from natural cheese
  - Stabilizers, emulsifiers and/or flavor enhancers are added
    - Creates consistent product
    - Provides smoothness
    - Improves shelf-life/stability



**Research drives progress**

- Sodium analysis of retail cheese
- Consumer perspective
- Consumer taste test



**Most comprehensive retail cheese study ever**

**Objective of the study:**

- Determine sodium levels in major cheese types
- Review variability in sodium levels across national brands, retailer brands, cheese forms and regions
- Identify areas of opportunity for the industry



Also analyzed industry data against National Sodium Reduction Initiative Targets (NSRI)

Approved: S. McCoy D. Graves W. Garret PO. Clark S. Sodum Content in Retail Cheddar, Mozzarella and Process Cheeses Varies Considerably in the United States, Journal of Dairy Science, March 2011.

**Included variety of cheese types and forms**

Cheddar: chunk and shredded  
 Mozzarella: chunk, shredded and string  
 Process cheese: process singles



Approved: S. McCoy D. Graves W. Garret PO. Clark S. Sodum Content in Retail Cheddar, Mozzarella and Process Cheeses Varies Considerably in the United States, Journal of Dairy Science, March 2011.

**Substantial variation across types of cheese**

**Levels of sodium in retail cheese**

	Label Sodium Range (mg/100g)
Cheddar Cheese	600 to 800
Mozzarella Cheese*	526 to 893
Process Singles	1185 to 1740

\*Low moisture part-skim mozzarella cheese

Approved: S. McCoy D. Graves W. Garret PO. Clark S. Sodum Content in Retail Cheddar, Mozzarella and Process Cheeses Varies Considerably in the United States, Journal of Dairy Science, March 2011.

**Given the variability, manufacturers are conservative**

Sodium levels in cheeses (mg/100g)		Analytical Average	Label Average
	Cheddar	615	648
Mozzarella	666	685	
Process Singles	1242	1313	

Approved: S. McCoy D. Graves W. Garret PO. Clark S. Sodum Content in Retail Cheddar, Mozzarella and Process Cheeses Varies Considerably in the United States, Journal of Dairy Science, March 2011.

**With less variability, sodium control can be tightened**

Sodium levels in cheeses (mg/100g)	Sodium Study Average Na(mg)/100g	NSRI 2012 Target Na (mg)/100g	NSRI 2014 Target Na (mg)/100g
	Cheddar	615	630
Mozzarella	666	630	600
Process Singles	1242	1250	1040

Approved: S. McCoy D. Graves W. Garret PO. Clark S. Sodum Content in Retail Cheddar, Mozzarella and Process Cheeses Varies Considerably in the United States, Journal of Dairy Science, March 2011.

**Research summary**

- There is a wide variation in sodium levels in cheese driven by type of cheese, brands and cheese form
- For some brands there is an opportunity to reduce variability without changing unique flavor profiles
  - Toward this end, a "best practices" task force has been commissioned
- NSRI 2012 targets appear within reach for most cheeses with best practices
- NSRI 2014 targets are going to take much more extensive change
- Quality, food safety and consumer acceptance of reduced sodium natural and processed cheese needs further investigation

Ajmal S, McCoy D, Groves W, Gerard PC, Clark S. Sodium Content in Retail Cheddar, Mozzarella and Processed Cheeses Varies Considerably in the United States. Journal of Dairy Science, March 2011.

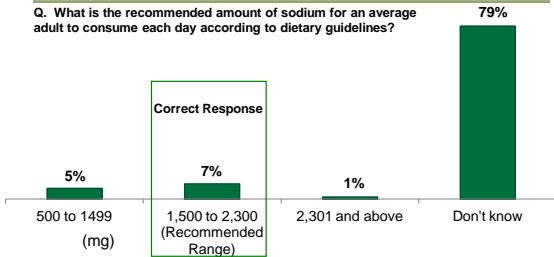


**The consumer perspective on sodium**



**Recommended level of intake for sodium is unknown by most**

Q. What is the recommended amount of sodium for an average adult to consume each day according to dietary guidelines?

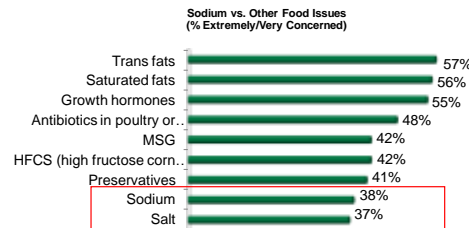


Health Focus Custom Sodium Survey, March 2010



**A little more than a third are concerned**

Q. Please select how concerned you are about each of the following.



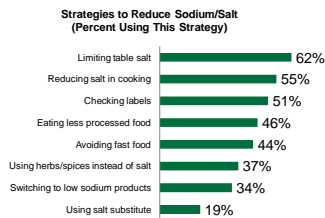
This level is significantly lower than for other food issues

Health Focus Custom Sodium Survey, March 2010



**Strategies to reduce sodium**

Q. What are you doing to limit or control sodium/salt in what you eat?

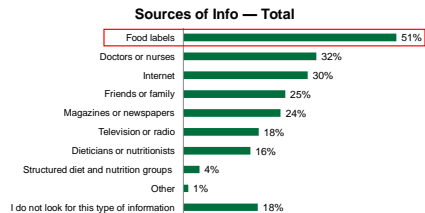


Innovation Center for U.S. Dairy Health & Wellness, Custom Sodium Survey, April 2010



**Food labels are primary source of information**

Q. What are your main sources of information about the health impact of eating sodium/salt?



Innovation Center for U.S. Dairy Health & Wellness, Custom Sodium Survey, April 2010



### Consumer sensory study to understand preferences

- Objectives:
  - Understand consumer reaction once reduced sodium levels are imposed
  - Determine the consumer acceptance threshold for sodium reduction

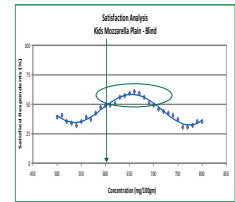
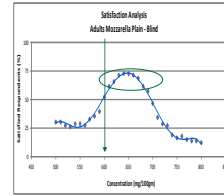


Interviewing took place May 17-June 11, 2010 - 150 adults/150 kids (10-16 years of age), Central Location Test in 3 Markets: CA, NC, NJ. Research Conducted by Sensory Spectrum, Inc.

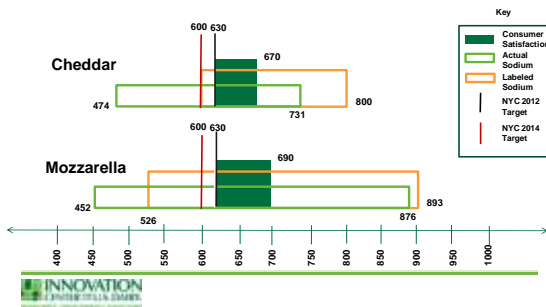


### Mozzarella satisfaction analysis

- The maximum amount sodium can be reduced without a substantial loss of satisfaction is 600 mg. Going lower than 650 mg will result in up to an additional 25% of adult respondents being dissatisfied when eaten plain.
  - Direction is clearer in plain evaluations than in application



### Room for improvement to better meet consumer satisfaction and health needs



### Summary of key consumer insights

- Reducing sodium below consumer preference levels impacts liking
- Most consumers do not know the recommended level of intake for sodium
- Consumers limit salt itself more than they eliminate foods
- Food labels are the primary source for sodium information



### Combining product and sensory learning generates new insights

- Across all three cheese varieties, there is a narrow range of sodium levels that provide the highest consumer satisfaction
- There is an opportunity to improve consumer satisfaction by reducing sodium variability
- NSRI 2012 target is just within reach of consumer satisfaction and is within reach for both actual sodium and analytical sodium for most cheese with best practices
- NSRI 2014 targets provide a challenge for products currently in market and for meeting consumer satisfaction



### Best Practices Task Force: Industry leading proactive solutions to address cheese and sodium



**Best Practices Task Force**

- Food Safety Curves
- Rapid Sodium Testing
- Education & Outreach



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**Health professional resources**

For Health Professionals



For Health Professionals to use with patients, clients and general public



[www.nationaldairyCouncil.org/cheeseeducation](http://www.nationaldairyCouncil.org/cheeseeducation)



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**Marketplace innovations in health and wellness**

Carol Blindauer, MBA, RD  
SVP, Health and Wellness  
Innovation Center for U.S. Dairy



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**From the farm to the fridge – the dairy industry delivers health and wellness solutions**



The dairy industry has been committed to health and wellness for nearly a century, providing one of the original wholesome foods – milk and milk products



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**Innovations taking place in two key areas**

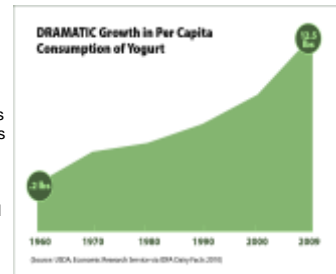
Emphasis on Benefits	Emphasis on Specific Needs
Multiple nutrients; including 3 of 4 nutrients of concern	Lower sugar
Healthy living across the lifespan	Lower sodium
Digestive health, including probiotics and lower lactose options	Lower fat



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**Dairy is a leader in digestive health**

- Yogurt noted as the “food of the decade” in the 2,000’s
- Dairy leads in development of products enhanced with probiotics and prebiotics
- Brands offering lactose-free milk growing — real milk, with the same essential nutrients



83

**Meeting public health needs for lower sugar**

**Flavored milk available to schools**

- 38% less added sugar
- 22.4 grams average total sugar (12 grams lactose)
- Average calorie level is 134
- 95% of flavored milk in schools is 150 calories or less

**Yogurt in the marketplace**

- 41 yogurt brands have new products with lower sugar



**Meeting public health needs: Cheese makers lowering sodium of cheeses available to schools and at retail**

- School processed cheese reduced to 200 - 300 mg of sodium per serving
- Companies have reduced sodium across their entire product line
- Brand introductions of new reduced and lower sodium cheeses



**Meeting public health recommendations for lower fat**

- 70,000+ quick-service restaurants offer low-fat milks
- 94% of total yogurt share is low-fat and fat-free
- 100 million + pounds of school cheese is reduced-fat, light or part-skim
- 200+ lower-fat cheeses have been introduced at retail



**Key takeaways**

- Dairy is an important part of nutrition and healthy living as evident in the Dietary Guidelines
- Dairy industry takes action to meet public health and consumer needs
- Dairy industry values the role of the registered dietitian



**Discussion**



**Thank you**

