Consumer Preference for and Attitudes about Pasteurized vs. Raw Milk Cheese

American Cheese Society Annual Meeting
August 5, 2011

Ann Colonna, M.S.
Sensory Program Manager
Oregon State University
Food Innovation Center
Portland, OR

ann.colonna@oregonstate.edu
Why do this again?

• Within the last year…
  – FDA legislative review, 60 day rule
  – Cheesemakers have been put out of business

• More comprehensive testing
  – More locations in different states
  – Different consumer demographics
  – Different cheeses
Specialty Cheese Test Objectives

1. To determine if consumers have a preference for raw vs. pasteurized milk cheese using a large sample of consumers from different locations along the west coast
2. To measure consumer knowledge of raw vs. pasteurized milk cheese
3. To understand consumer preference for the 60 day aging rule for raw milk cheese in the U.S.
4. To better understand the most important attributes of specialty cheeses and the drivers of liking
Quantitative Consumer Study

Consumer Recruitment

Conduct Central Location Tests along the U.S. West coast (WA, OR and CA) with 1,000 consumers. Ages 18 and older. Must like and regularly buy cheese. Consumers were not paid an incentive for participation.
The quest to find locations!

- Willing participants
- No incentives
- Feasibility of test set up – computers
- Funding
- Acceptance of organization
- Finding Consumers of Specialty Cheese!
Testing locations

San Francisco

Bend, OR

Montreal

Seattle
Testing Locations

- Seattle Cheese Festival, n=355
- Bite of Bend Food Festival, n=495
- Ferry Plaza Building in San Francisco, n=376
- ACS Registration, Montreal Convention Center, n=30
The quest to find cheese!

- Willingness to participate
- Made by same producer
- Same style/method
- Same age
- BUT WITH DIFFERENT MILK
  - PASTEURIZED MILK
  - RAW MILK
Samples – Rogue Cheddar
Pasteurized Milk Cheese – 12/10/09
Raw Milk Cheese – 11/23/09

Rogue Sharp Cheddar Cheese
Saint Olga, Rivers Edge Chèvre

Pasteurized Milk Cheese – 11/28/10

Raw Milk Cheese – 1/15/11

Rivers Edge Chèvre

Fresh and aged artisanal farmstead goat cheese hand-crafted in Oregon’s Central Coast Range.

washed rind goat’s milk cheese
Brindisi, Willamette Valley Cheese

Pasteurized Milk Cheese – 6/15/2010

Raw Milk Cheese – 5/10/2010

natural rind cow’s milk cheese
Beecher’s Flagship Cheese

Pasteurized Milk Cheese – 10/2009

Raw Milk Cheese – 12/2009

Beecher’s Aged Flagship Cheese – Cheddar Style
Moses Sleeper, Jasper Hill

Pasteurized Milk Cheese – made 5/26/11

Raw Milk Cheese – made 6/4/11

Bloomy rind cow’s milk cheese
Materials & Methods

- Pasteurized and Raw Milk Cheeses from five cheesemakers were used
- DIFFERENCE TESTING – first consumers
- Samples were cubed/sliced and served (two per coded plate)
- The first 20 consumers received plates with randomized code identifiers (without any product information), while the next 20 received plates with the labels “Raw Milk Cheese” and “Pasteurized Milk Cheese” cheese
- This randomization of unlabeled vs. labeled switched after every 20 consumers throughout the test
How often do you buy Specialty Cheese?

- Most of the consumers tested are frequent purchasers of specialty cheese.
Where do you buy most of your cheese? SEATTLE

Where do you buy most of your cheese, n=355

- Natural foods grocery stores=Whole Foods, PCC, Natural Markets
- Conventional grocery stores=Fred Meyer, Safeway, Thriftway

Bar chart showing:
- 45% buy from Natural foods grocery stores
- 28% buy from Conventional grocery stores
- Others include specialty cheese retailers, Costco, Walmart, farmer's markets, restaurants, independent food co-ops, internet sales, and other.
Where do you buy most of your cheese, Bend, OR, n=490
Where do you buy most of your cheese? SAN FRANCISCO

Where do you buy most of your cheese, San Francisco, CA, n=373

Percent Response, Select all that apply

- Natural foods grocery stores (e.g. Whole Foods)
- Conventional grocery store
- Farmer's market
- Specialty cheese retailer (e.g. Costco, Wa...)
- Warehouse retailer (e.g. Costco, Wa...)
- Independent food co-operative
- Direct sale from cheesemaker (on...)
- Restaurant
- Internet sale
Please select your gender.

- A very even distribution

Specialty Cheese Test Participant Gender Distribution, All locations, n=1206
Please select your age.

- Over 70% of the consumers tested were between the ages of 18-45 yrs; the target consumers moving forward over the next decade

<table>
<thead>
<tr>
<th>Specialty Cheese Test Participant Age Distribution, All locations, n=1206</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent Response</td>
</tr>
<tr>
<td>--------------------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Please indicate the highest level of education you have completed.

- 77% of the consumers tested had completed either a 4 year college or had an advanced degree

Specialty Cheese Test Participant Education Distribution, all locations, n=1206
Location of Residence – Seattle

- 23% of the consumers tested in Seattle were from outside the state

### Residence of Specialty Cheese Test Participants, Seattle, WA, n=354

- **Seattle metro area**: 65
- **NW Washington**: 9
- **Other U.S. state**: 9
- **Oregon**: 6
- **California**: 4
- **Canada**: 3
- **SW Washington**: 2
- **E Washington**: 1
- **Outside U.S. not Canada**: 1

Percent Response

0 10 20 30 40 50 60 70
• 14% of the consumers tested in Bend were from outside the state
32% of the consumers tested in SF were from outside the state.
Please indicate your total annual household income before taxes.

- 70% of the participants tested had an annual household income above $40,000/year

**Specialty Cheese Test Participant Income Distribution, All locations, n=1205**

<table>
<thead>
<tr>
<th>Income Range</th>
<th>Percent Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $20,000</td>
<td>15</td>
</tr>
<tr>
<td>$20,000-$39,999</td>
<td>14</td>
</tr>
<tr>
<td>$40,000-$59,999</td>
<td>13</td>
</tr>
<tr>
<td>$60,000-$79,999</td>
<td>14</td>
</tr>
<tr>
<td>$80,000-$119,999</td>
<td>18</td>
</tr>
<tr>
<td>$120,000 or more</td>
<td>26</td>
</tr>
</tbody>
</table>
Difference Test Results, Rogue Cheddar
Two of the cheeses are the same. One is different. Pick the different sample.

- **Statistically** consumers could tell a difference between the unpasteurized (raw) milk cheese sample and the pasteurized sample in the cheese difference testing (at the 99.9% confidence level).

*Scores with the same letter are NOT significantly different, p<0.05.*
Difference Test Results, River’s Edge Saint Olga
Two of the cheeses are the same. One is different. Pick the different sample.

- Statistically consumers could tell a difference between the unpasteurized (raw) milk cheese sample and the pasteurized sample in the cheese difference testing (at the 99.9% confidence level).

![Triangle Difference Testing of Raw vs. Pasteurized Milk washed rind goat's milk cheese, n=42, p<0.001](image)

*Scores with the same letter are NOT significantly different, p<0.05.*
Difference Test Results, WVC Brindisi
Two of the cheeses are the same. One is different. Pick the different sample.

- Statistically consumers could tell a difference between the unpasteurized (raw) milk cheese sample and the pasteurized sample in the cheese difference testing (at the 95% confidence level).

*Scores with the same letter are NOT significantly different, p<0.05.*
Preference Test Results 2008
Please taste both cheeses. Which cheese do you prefer?

- Statistically more consumers preferred the raw milk cheese sample to the pasteurized milk sample in the cheese preference testing (at the 99% confidence level).
- 4 different cheeses

*Scores with the same letter are NOT significantly different, p<0.05.*
Preference Test Results 2011
Please taste both cheeses. Which cheese do you prefer?

- Statistically there was no preference between the pasteurized milk cheese samples and the raw milk cheese samples

![Preference for Pasteurized vs. Raw Milk Cheese, n=901, p<0.05](chart)

*Scores with the same letter are NOT significantly different, p<0.05.*
Preference Test Results
Please taste both cheeses. Which cheese do you prefer?

• Statistical difference for some locations

Preference for Pasteurized vs. Raw Milk Cheese, by location, n=901, p<0.05

*Scores with the same letter are NOT significantly different, p<0.05.
Preference Test Results
Please taste both cheeses. Which cheese do you prefer?

- There were differences within each cheese sample

*Scores with the same letter are NOT significantly different, p<0.05.*
Please taste both cheeses. Which cheese do you prefer? (Cont.)

- More consumers preferred the pasteurized cheese when the cheeses were unlabeled.
- Strong preference for raw milk cheese when the plates were labeled.

Effect of labeling on preference for Pasteurized vs. Raw, n=901

- Labeled: 41% preferred Pasteurized, 59% preferred Raw.
- Unlabeled: 56% preferred Pasteurized, 44% preferred Raw.
Would you like to see labeling on the cheese package that clearly states whether the cheese is made with pasteurized or raw milk?

- Over 60% of the consumers tested feel that milk type labeling is important. Just under 25% don’t feel that the type of milk in their cheese is important.
Which cheese has a more complex flavor? - 2008

- By a two to one margin, consumers felt the unpasteurized cheese had a more complex flavor than the pasteurized milk cheese.
Which cheese has a more complex flavor?

- These consumers felt there was no difference between the complexity of flavor between the raw and pasteurized cheeses.

Which sample had a more complex flavor, n=898, p<0.05

- Pasteurized: 51%
- Raw: 49%
Which cheese has a more complex flavor?

- Large differences when broken out by cheese

![Bar chart showing percent response for different types of cheese](chart.png)
Why did you prefer the sample you did? (Check all that apply.)

- Most felt flavor was a factor in their preference, while over 50% selected texture as a key attribute for both milk types.
Do you know the difference between raw milk and pasteurized milk cheese?

Know difference between pasteurized and raw milk cheese, n=862

- Yes: 68%
- No: 32%
For general consumption, do you prefer to buy cheese made with pasteurized milk or raw milk?

- Over 40% of the consumers tested buy both cheeses equally. Another 20% don’t know which they prefer to buy. About even for raw and pasteurized preferences.
Which of the following characteristics define pasteurized milk cheeses in your opinion? (Check all that apply.)

- More safe: 50%
- Less complex flavor profile: 45%
- Lower price per pound: 45%
- Positive health attributes: 33%
- Lower quality product: 28%
- More complex flavor profile: 19%
- Lower price per pound: 14%
- Positive health attributes: 13%
- Higher price per pound: 11%
- Less safe: 8%
- Small production/Farmstead/Artisan: 6%
- Less safe: 5%
- Less safe: 2%

Pasteurized milk cheese characteristics, n=355
Which of the following characteristics define raw milk cheeses in your opinion? (Check all that apply.)

- Small production/Farmstead/Artisan
- More complex flavor profile
- Higher price per pound
- Higher quality product
- Positive health attributes
- Lower quality product
- Less complex flavor profile
- Consistent product
- Lower price per pound
- More safe
- Large industrial production

**Raw milk cheese characteristics, n=355**

Percent Response, Select all that apply
Rank, in order of importance, your preference for the following cheese characteristics.

- The characteristic “local” was significantly more important than other listed characteristics of cheese production. “Artisan” and “sustainable” were equally preferred and “organic” and “farmstead” were the least preferred.
Rank in order from most important (1) to least important (8) the characteristics on which you base your cheese purchases.
Would you be willing to spend more money on a cheese if you knew that it was made with pasteurized or raw milk?

- More consumers are willing to spend more money on a cheese made with raw milk.
Do you feel that pasteurized milk and raw milk cheeses are equally safe to eat?

- Over 40% of the consumers tested feel that the two cheese types are equally safe to eat, but another 35% are unsure. Just over 20% don’t feel the two cheeses are equally safe to consume.
Opinion of possible FDA ban of the sale of raw milk cheese in the U.S.

- 95% of the consumers tested are NOT in favor of banning the sale of raw milk cheese in the U.S.

How would you feel about the FDA banning the sale of raw milk cheese in the U.S. altogether, which would outlaw the sale of raw milk cheeses such as Parmigiano Reggiano, Roquefort, Rogue River Blue and Comte?, n=935

![Bar chart showing the percentage of consumers' opinions on banning raw milk cheese in the U.S.](chart.png)
Raw milk cheese is legal under U.S. federal law if it is aged at least 60 days. How would you feel about the FDA extending the aging requirement past 60 days, which would outlaw the sale of some raw milk cheeses?

- About 60% of the consumers tested want to see the 60 day rule relaxed to give cheesemakers more flexibility to produce younger raw milk cheeses.

![60 day rule, n=936](chart)

- **Relax law**, cheesemakers have flexibility to produce younger raw milk cheeses: 58%
- **Keep the existing laws**: 33%
- **Extend aging requirement, some raw milk cheeses would be banned**: 9%
Specialty Cheese Test Results Summary

Preference for Pasteurized vs. Raw milk cheese

- Overall there was no significant difference in the preference for raw vs. pasteurized milk cheese – different from 2008 – depends on the cheese

- Stronger preference for raw milk cheese when the plates were labeled as “raw milk” vs. using 3 digit codes

- Overall, there was no significant difference in which cheese consumers found to have a more complex flavor – depends on the cheese

- More consumers are willing to spend more money on a cheese made with raw milk
Specialty Cheese Test Results Summary

• Only 40% of the consumers tested feel that PM vs. RM cheeses are equally safe to eat.

• About 60% of the consumers tested want to see the 60 day rule relaxed to give cheesemakers more flexibility to produce younger raw milk cheeses.

• 95% of the consumers tested are NOT in favor of banning the sale of raw milk cheese in the U.S.