

# *The Sustainability of the Cattle Industry*

: Investigating the factors that influence one's ability to control adulterants in their dairy + beef products

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**Food adulteration:** The deliberate and intentional substitution, addition, tampering or misrepresentation of food, food ingredients, or packaging; false or misleading statements made about a product for economic gain.

**Why does it occur?**

Food adulteration often occurs to increase the quantity of a product for greater food production and sales with minimum investment. It may also occur to meet the food demands of a rapidly growing population.

**Negative impacts?**

Food adulteration posits a significant risk to our health as a food impurity. Adulterants may decompose at a later date and become infected with bacteria, causing greater contamination at a later date. They result in a misled 'fulfilment' of nutritional needs leading to malnourishment and deficiencies.

Hormone and steroid additives are particularly harmful to female reproductive health.

**How does it occur?**

Milk quality is often evaluated across common parameters such as fat percentage, SNF (solid-not-fat) %, protein content, and freezing point, and adulterants are added to increase these parameters.

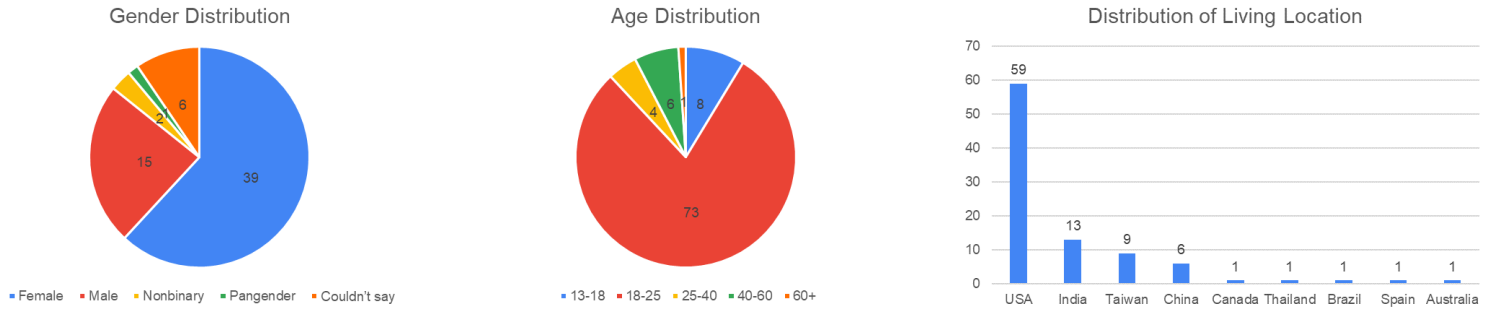
<b>Adulterant Added</b>	<b>Reasons for Use</b>
Oxytocin	To increase milk production from lactating animals
rBGH	Used as a growth hormone for cattle
Starch, Sulphate Salts	To increase solid-not-fat content of milk
Urea	To increase non-protein nitrogen content of milk
Melamine	To increase protein content of milk
Water	To dilute milk and lower production costs
Ammonium Sulphate	To increase the lactometer reading by maintaining the density of diluted milk
Formalin, Salicylic Acid, Benzoic Acid, Hydrogen Peroxide	Preservatives to increase shelf life of milk/ beef
Vegetable Oil	Used to replace the more expensive milk fat while maintain milk fat content
Detergent	To emulsify and dissolve the oil and produce a desirable, frothy solution to milk
Carcasses	In beef production to reduce production costs of using live cattle

Additionally, fertilizers and pesticides may contaminate dairy and beef products through biomagnification. It may be initially used on the food eaten by the cattle, however as it moves up a trophic level the tissue concentration of the contaminant increases.

# Consumer Surveys

Our investigation began with a survey sent out to the general consumer to get a baseline understanding of their food habits, what choices they made and how informed they were, and their knowledge of these adulterants.

*In total, we recieved 92 responses. Here is the demographic we surveyed:*

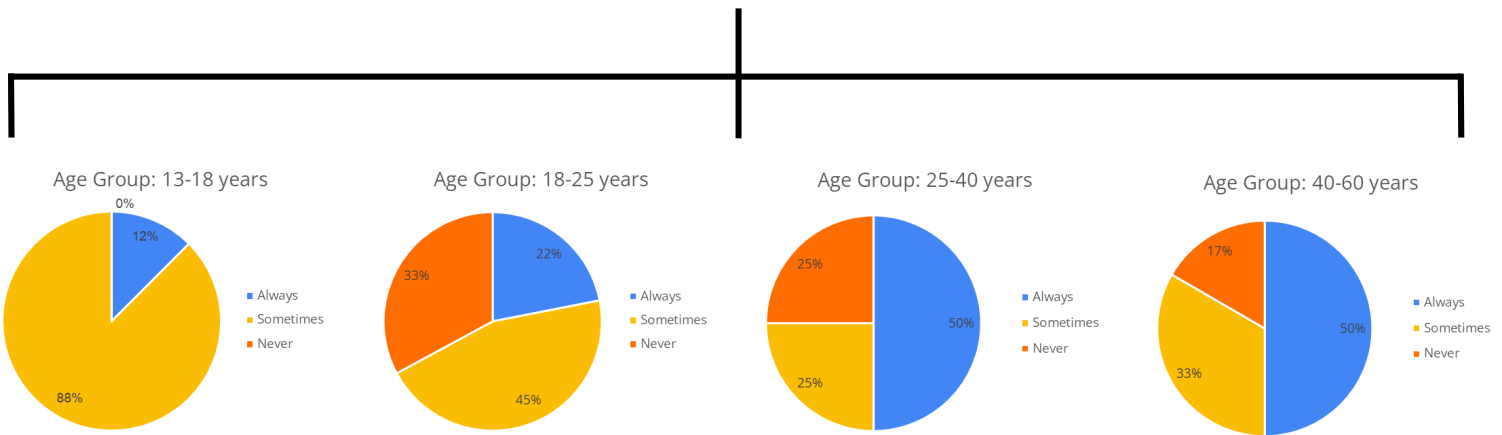
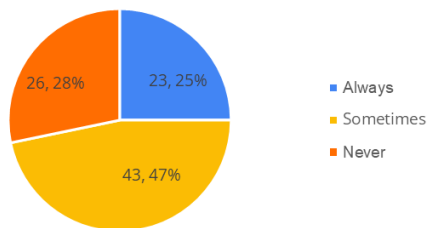


*Here are some key insights:*

## 1) Correlation between age and attention to food labels + adulterants

Attention to Food Labels and Adulterants (Full Survey Sample)

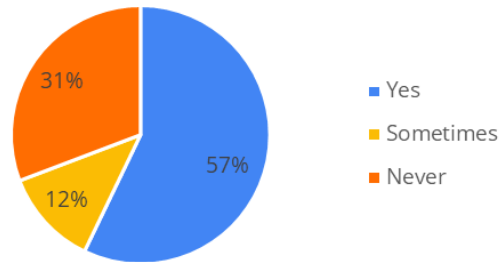
Although 68% of the survey sample makes their own food, only 23% always check their food labels for adulterants



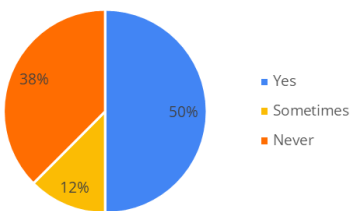
As the age of our survey taker increases, their consciousness about the food they are consuming and attention to food labels for nutrition facts, ingredient information and potential adulterants also increases. However relative to the size of each group, few individuals tend to be mindful or aware of the context of the food they eat.

## 2) Correlation between age and independence in food making

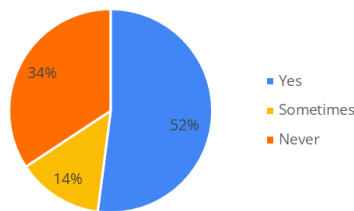
Percentage of Survey Sample that Makes Thier Own Food



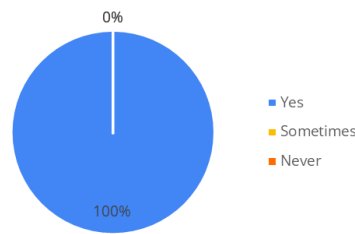
Age Group: 13-18 years



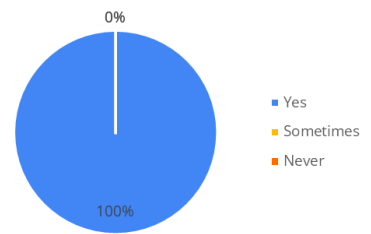
Age Group: 18-25 years



Age Group: 25-40 years

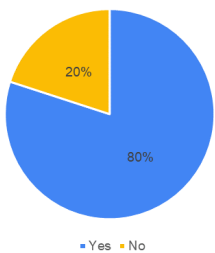


Age Group: 40-60 years

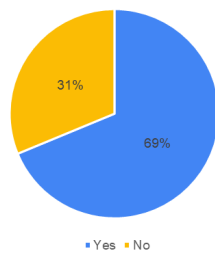


Out of those that answered yes/ sometimes,, what percentage of each age group makes conscious decisions about the groceries they buy, i.e. organic vs. non-organic produce?

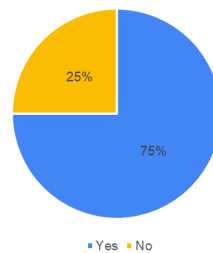
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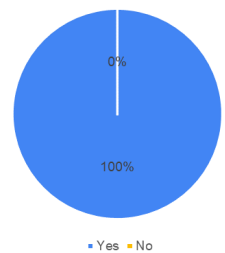
Age Group: 18-25 Years



Age Group: 25-40 Years



Age Group: 40-60 Years



It can be seen that as the age of our survey taker increases, their likelihood to be making their own food increases. Increased independence in food making means that they are also responsible for making associated choices. Hence as age increases, our survey taker is increasingly likely to make a conscious decision about the groceries they buy and have more control over the adulterants they may be consuming.

# Consumer Interviews

*While the consumer survey helped in providing a quick understanding of how much people knew about the quality of the food they were consuming alongside the habit and demographic factors that influenced their awareness, we were interested in further understanding why and how people were making their food choices.*

Numerous in-depth consumer interviews were conducted with people of different ages, gender, race, living areas, and occupation to best understand a wide variety of perspectives. Questions about their dietary habits, choice of dairy and beef products suppliers and concerns they have with the products they consume were asked, and an activity analysis was conducted.

*Here are some key insights:*

# 1

**Most people were very conscious about the quality and source of the beef they were eating, trying to choose locally raised cattle and buying directly from the source, however, there was less attention paid to the quality of the milk they were drinking.**

For example, here are some comparisons of the responses given by interviewees explaining their choice in beef consumed v.s. dairy consumed:

Interviewee 1:

Beef: Buys homegrown, grain-fed beef from cows that are locally raised, and buys directly from the cattle farmer who raises and slaughters the cows.

Dairy: Buys 2% brand milk.

Interviewee 2:

Beef: Buys beef regularly sold in the grocery market but from brands that are highly reputed.

Dairy: Buys 2% brand milk because it contains fewer calories.

# 2

**Where one lives drastically impacts their potential to choose their food suppliers.:**

One interviewee lives in Mumbai, right in the middle of a highly urbanized metropolitan area. Unfortunately, local dairy producers have not been able to scale up large enough to make their products available on a larger scale in India. Even though this interviewee would prefer more sustainable, locally produced fresh milk, she has to resort to the standard 4%, packaged milk widely made available.

Alternatively,

a second interviewee grew up in the more rural outskirts of Mumbai and regularly drank fresh buffalo milk. This was used for homemade dairy products. However, she later moved into the city and now must resort to the standard packaged milk.

She notices a very large difference in the taste, thickness, purity, and nutrition levels of the milk. Packaged milk is not thick enough to make dairy products out of at home.

### **Trust and reliability play a very large role in choosing produce suppliers:**

# 3

One interviewee is from Korea, however, currently lives in China. Despite higher prices and decreased ease of availability, they purchase Sanyang milk/ Yonsei milk, a Korean milk because of the assurance of receiving a high-quality product.

Another interviewee discussed that dairy products such as 'ghee', are only bought from their hometown from sources that have been trusted in their family through generations.

Many interviewees discussed buying imported beef from countries such as Britain and Australia due to higher product quality and greater transparency in their production methods.

It is evident that the trustworthiness and reputability of a supplier are often given higher precedent than the sustainability of their choice.

## Extreme User Interviews

To understand all parts of this food cycle, more specialized interviews were conducted on the production and distribution ends. After speaking with the Executive Chef at RISD Dining, David Gould, and a self-supplying dairy farmer, I gained more insight into the factors that influence quality control of the food they distribute and produce respectively.

### **David Gould, Executive Chef at RISD Dining**

- Is highly educated in the areas of sustainable food production, consumption, and organic farming
- Has a background in college dining so feels responsible for making decisions that positively impact students, and speak to the traceability of the produce/ ingredients they source

#### *Questions Asked:*

- Where does RISD Dining get its beef/milk supply from?
- How was that choice made?
- How much are you kept aware of the context in which your milk/beef is produced? Eg. Ingredients? State of the cattle ranch? State of the cows?
- How do the ingredients/nutrition facts label influence the choice in milk/beef provided by RISD Dining?
- What resources go into maintaining product freshness until it reaches the students?

### **Self Supplying Dairy Farmer**

- Along with husband and friends, purchased a Jersey cow to explore milking and milk processing
- Uses milk to make their own butter, yoghurt, ice cream, sour cream, etc.

#### *Question Asked:*

- How does your milk taste compared to store-bought milk?
- How do you process your dairy?
- What positive/ negative effect do you think milk or beef has on your body?
- Do you know where the produce you don't grow yourself comes from?
- What effect do you think nutrition has on your physical and or mental health?

Here are some key insights:

1

### Size of Corporation

David Gould spoke about how RISD Dining is a small department with a small leadership team. Being essentially self-run without the interference of corporate management, they have total control over their actions and can make decisions that align with their core values and moral code.

Because they are bulk buying, they are also able to negotiate higher quality, more sustainable products at lower prices and better conditions for the cows that are bred.

Moreover, he spoke about how although there is often a lacking trust in large corporations for making ethical choices over economic gain, they are also sometimes the ones who have the ability to back up their claims and provide certified goods. This becomes a reason why many people choose large brand names over local producers for certain products.

Learning more about the supply chain, I found out that often farmers produce more goods than they can sell and so often have to rely on larger corporations to make the most of their produce, even though they know they could secure higher prices if they went directly to the consumer.

An interesting fact I found out: Many farmers often produce organically, but do not have the money to pay to be certified as organic. This is an example of a situation where bureaucracy and legislation get in the way.

As a self-supplying business, the dairy farmer is producing on an extremely small scale (just family and friends) and also has total control over her produce. Milking a cow twice a day, she produces unpasteurized milk with zero additives that is kept fresh by freezing and using sterile containers. It is illegal to sell unpasteurized milk commercially in her state, however, because she is self-supplying, she is able to maintain this quality control.

2

### Budget and Priorities

David Gould speaks to how RISD Dining is required to adhere to a very strict budget because they cannot raise the price paid by students. They also need to be conscious of how many people they are feeding and the expenses related to that. They thus try to find the best balance between a reasonable, negotiated price with giving students high quality products/ food (their priority).

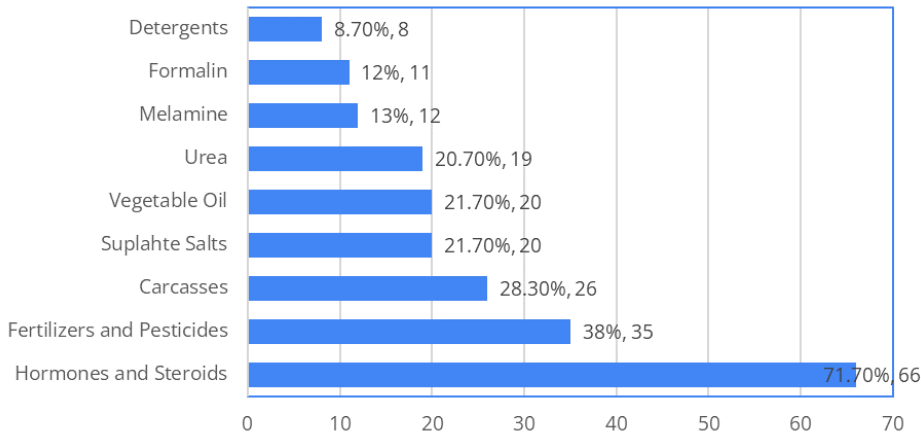
RISD Dining tries to source their produce locally as far as possible (eg. Windsor Dairy) and work with suppliers that align with their moral code (eg. Cabot Dairy, which networks with farmers that further their own core mission of producing sustainable goods). They also work with FINE (Farm to Institution Rhode Island) which works to empower and save New England farmers.

Alternatively, the self-supplying farmer has only their own nutrition and health in mind with no economic gain or budget to account for. They chose to buy a Jersey cow because of the higher levels of protein, calcium, vitamins, and butterfat it contains, and find that it tastes much better than store-bought milk. No preservatives or additives are used.

# Education and Awareness

From the consumer survey, we found :

Knowledge of Common Dairy + Beef Adulterants  
( Across Full Survey Sample )



In this question, survey takers were asked about which of these adulterants they associated with dairy and beef. From the results, it is evident that a majority (72%) had knowledge of hormone and steroid additives, perhaps due to increased awareness of GMOs from product marketing and packaging. This was followed by pesticides and fertilizers (38%) and carcasses (28%), perhaps because they could still be associated with agriculture and the cattle industry. However, there was very little knowledge of all other adulterants.

Some anecdotes from consumer interviews :

**Interviewee #1: White Female in late 60's living in the US, Grandmother and School Teacher**

: Has found that the beef she buys directly from a local farmer that is homegrown and grain-fed beef tastes completely different from store-bought beef.

**Interviewee #2: White Female in 50's living in the US, Stay at Home Mother**

: Has been feeling much healthier since beginning to shop in the organic section.

**Interviewee #5: Indian Female, 49 yo, living in India, Mother and Working Professional**

: Sometimes notices her milk has a funky smell, an oily layer at its top, a grainy texture, or is too watery. Has noticed that when milk consumption was reduced, she felt less bloated and gassy and her husband's diabetes was in check.

**Interviewee #6: Indian Female, 28 yo, living in India, Wife and Working Professional**

: Feels fresh milk is much more thick, pure, and nutritious than packaged milk.

Some anecdotes from the Producer+ Distributer interviews :

**David Gould, Executive Chef at RISD Dining**

: Believes transparency in the industry has been getting better over the past 20 years as consumers ask more questions and legislation has formed around ingredient use, however, it takes a lot of digging to find any real information

**Self Supplying Farmer**

: Has found that they have far fewer stomach issues (i.e. acid reflux) since switching to raw milk consumption

While it is evident that consumers are often aware when something is amiss about the milk/ beef they are eating, and have often felt a positive change after switching to more sustainable, organic produce, they are often unaware and unable to identify exactly what causes these experiences.



# Concluding Statement

*While increased awareness and education about food adulterants is extremely important to help consumers and food distributors make more informed, sustainable food choices, there are many more factors sometimes beyond their control, as explored through this report, that affect one's ability to make such change.*

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