

**Analyzing the Correlation Between Overall Likeness and  
Emotional Responses Before and After the Consumption of  
Dairy Beverages**

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## **ABSTRACT**

In today's food industry there is a need for more research on the correlation between likeness of a product and what kind of emotional response this may lead to. This has potential to allow the food industry to understand consumer purchase intent and use the data collected from specific studies to gain more insight to repeat purchases. The objectives of this study were to understand more about the relationship between overall likeness of dairy beverage products from initial taste to ending taste as well as how these responses related to the emotional responses of the consumption experience. In two geographical locations, two hundred and nineteen subjects were recruited and screened for three days of consumer testing. One of the three days the study was conducted, subjects specifically sampled seven select dairy beverages. Subjects were asked to record their current emotion prior to consuming each sample product, asked to evaluate textural attributes, and then answer three hedonic based questions. These questions were compared to the emotional responses for each dairy beverage. It was found that products which showed higher hedonic ratings also had overall higher positive emotional responses based on consumption. Also the nontraditional dairy beverages like Silk Almond Dark Chocolate received lower hedonic scores than traditional dairy products and thus elicited lower emotional responses. These results give considerable insight on the measurability of consumer emotional responses and overall likeness as important factors in determining if a consumer may consume and purchase that same product again.

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## **INTRODUCTION**

Within the last ten years, sensory evaluation has grown to be a very important part of product evaluation, product development, and can even be used to help advertise and market products. This study takes a further look into how the hedonic score on overall likeness of a product correlates with either positive or negative emotional responses and how this can potentially lead to repeat purchases of dairy beverages. Emotions are a huge part of why consumers behave the way they do. If the dairy industry can look deeper into the emotional responses consumer have to dairy products, perhaps they can create more emotional experiences towards purchasing and consumption of dairy products in general. There is only one study to date that measures emotional responses to the odors of dairy products not including consumption (Seo et al., 2009). This study conducted at Cal Poly and Ohio State is a great starting point on how to measure emotion in regards to the consumption of dairy beverages. Continued research in the future can lead to potential marketing strategies using emotions to encourage repeat purchases. If the dairy industry is able to better understand consumers emotionally then this new research would greatly benefit the dairy industry all over the nation, California, and especially local dairymen in the future.

## **LITERATURE REVIEW**

### ***Importance of Sensory***

Sensory evaluation is important to the understanding of consumer needs, expectations, and emotional benefits from a product. It is also extremely important in product development. Sensory evaluation research began in the 1940's (Kemp et al., 2009) and according to Lori

Rothman (2010) of Kraft Foods, sensory guidance research has been drastically changing in just the last 10 years alone, with great potential for even more growth. New and innovated sciences in the sensory field are more frequently researched, including how to measure food experiences that effect consumers emotionally.

**Table. 1** References of sensory analysis studies for various dairy products

Cheese	Lawlor et al., 2001
Milk	Chapman et al., 2001
Yogurt	Bayarri et al., 2011
Whey	Jimenez et al., 2008
Ice Cream	King, B.M. 1994

What Rothman (2010) terms as “old school” sensory was less complex than it is today and even today’s research will be far less complex than what will come in the future. The comparison of “old school” sensory research to “new school” sensory research is drastically different. “Old school” sensory research would consist of product developers creating prototypes without complete understanding of how the product would turn out. When these products were tested on consumers and failed to meet expectations, the prototype would be readjusted and retested by consumers. This process tends to be a fairly slow process, dependent upon product success or failure. Today’s “new school” sensory researchers conduct research on products which are already on the market, this helps both the researchers and product developers understand how to create and test potential ideas before having to create a prototype (Rothman, 2010). Ultimately, this can save a company a lot of time and money as well as increasing the

odds of a new product being successful on the market. Today our world revolves around business, marketing and making money, and for this reason sensory has become so important to product development. In Table 1 there are various examples of studies which relate to sensory of a few major dairy products consumed today, from these studies it can be determined that sensory is important for many reasons and can specifically be applied to dairy products and the food science industry.

### ***Consumer Preference Versus Trained Panels***

There are two main groups of sensory testing, one is technical sensory research, which involves trained panelists and the other is consumer guidance research where consumers give valuable information on their personal preferences (Rothman, 2010). Trained panels are able to distinguish specific attributes of a product because they have been trained to be very sensitive to the differences in products, whereas consumers are less sensitive to the differences in a product and can only give personal opinions and preferences of products. The main difference between the two is that technical sensory research uses humans to tell the differences in products, whereas consumer sensory research uses products to tell the differences in consumers (Rothman, 2010). Rothman describes the use and necessity of trained panelists in comparison to a chemist having a fine tuned instrument to collect data, only in sensory the use of human instruments give us the necessary data. Training of these panels is quite extensive and their skills will constantly need to be maintained in order to collect consistent data. On the other side, consumer preference panels answer a different type of question that pertains only to the consumers' personal preferences of the product rather than specific attributes.

There are two downfalls to having to conduct a consumer preference test: time and money. Many times companies will use what are called convenience panels to mimic the evaluation of consumers. Usually these subjects are company employees, which is a quick and easy source of free data. These subjects can potentially provide unrealistic data due to hidden biases related to the product or brand (Rothman, 2010). The most valuable consumer data is collected from people who actually purchase and specifically use the test product.

### ***Hedonic Scales***

The use of a hedonic scale is very valuable. It is assumed that the consumer will only purchase a product if they like it. But what exactly is a hedonic scale and why is it so valuable to sensory research? The most well-known and commonly used scale worldwide is the 9-point hedonic scale designed by Peryam and Girardot in 1952. Hedonic scales are used to record the subject's degree of likeness of a sample or product and help to determine product acceptance by a consumer. The nine points on the scale are given a description from "extremely dislike" to "like extremely" also including neutral descriptions in between to show different degrees of likeness. From the analysis of the variance it is possible to identify significant differences (Moskowitz and Sidel 1971). While executing a hedonic scale test, it is beneficial to randomize samples in order to remove bias because individuals usually score the first sample abnormally higher than the others (Kemp et al., 2009).

A child friendly version of the typical hedonic scale, known as the snoopy scale, allows researchers to evaluate children's responses to products. The snoopy scale is a visual facial scale of seven different emotions: three of which are negative, one neutral, and three positive (Kemp et al., 2009). In the current study conducted, the idea of the visual scale with similar positive and



negative emotions were tailored for adult subjects to enhance emotional responses. The subjects were asked to find pictures displaying emotional reactions that depicted each given emotion. It was believed that by linking an emotion to a personal picture that it will help subjects to pinpoint emotions that they can relate too, rather than having to guess if the emotion they feel actually relates to the given photo or statement on the questionnaire. Reading words which describe emotions such as extremely like, lightly like, neither like nor dislike, dislike moderately, and extremely dislike may be perceived differently and may not equally relate to a specific emotion depending on each subject. By taking physical pictures or drawings of emotions we can more directly link an exact emotion or series of emotions to the experience of consumption. The analysis of variance from a hedonic scale test allows the researchers to draw conclusions about how consumers like a product, or make comparisons between the scores from several products as long as the same scale was consistently used (Kemp et al., 2009).

When interpreting results from a hedonic scale, the results are not directly based on the 9-point scale itself. Dr. David R. Peryam creator of the 9-point hedonic scale responded to a letter about interpretation of results to one of his clients. Dr. Peryam states that there are many ways to analyze results depending on each circumstance. Interpretations are somewhat dependent on what type of product is being tested and that certain product groups that will receive higher scores on a hedonic scale test based on their desirability (Peryam et al., 1998). Comparing candy to a staple food item like bread will result in a different range of scores because each product group is viewed differently by consumers. When looking at the scores received it must be taken into account that because the scale is 9 points, that doesn't mean that the scale must be taken literally based on the results. Candy for instance, will naturally receive higher hedonic scores because it is a delicacy type of product compared to the scores of a staple food item such bread,

which will most likely receive lower scores because it is a more commonly consumed food group. Hypothetically, candy receives a score range of 5-8 on a hedonic scale test. When interpreting these results it must be taken into account that although a score of 5 may be average in comparison to the total 9 points of the scale, in this case a score of 5 will be a low score and a score of 8 being a high score. Likewise for bread, hypothetically the scores ranged from 3-5, a score of 3 being a low score and a score of 5 being a high score. These two example studies cannot be equally compared, thus individual interpretation is essential in analyzing data to better understand the results.

### ***Emotional Responses***

Emotions are something every human is familiar with which is why it would be a perfect tool to understanding the connection between emotions and the experiences from food consumption. It is already known that there is a correlation between the two, but there is very little published scientific research that has been completed on the relationship between the two. This is why sensory research of emotions is becoming a vastly researched field. According to King et al., this can be for two reasons, one of which is because companies will do research and seal their data to gain a competitive edge, the other is the lack of an established standard method for measuring emotions associated with food and product development.

Laros and Steenkamp are credited with setting the basis of the positive-negative emotions in which they have divided up the majority of popular emotions into eight main categories. These are anger, fear, shame, and sadness for the negative categories and contentment, happiness, love and pride as the positive categories (Laros and Steenkamp 2005). Although we need to take into

account that this was not a food sensory related study, but it does have the basic principles that aid in sensory research to develop a standard method to measuring emotion.

A recent study conducted by King and Meiselman (2010) has given sensory researchers a very valuable tool to measure emotions of food. They set a foundation for measuring emotions from the consumption of food in a commercial setting by creating a questionnaire. The development of the questionnaire was derived from modified emotional testing approaches used in the psychiatric field. It was then applied to a commercial setting in food product development has been proved successful. The questionnaire was tested on consumers via the internet and in person. From this they were able to conclude that the majority of the responses were positive emotions towards food consumption experiences. They did warn that in no way are the emotions used in the study a final set of emotions but that it is a good starting point in researching the impact of foods on emotions. A few key results concluded that the emotional profiles of current product users are different than that of non-users. The results showed that the current product users will produce more positive results while the non-users will produce more negative results.

Experiences from food consumption also play a pivotal role in emotional responses. Consumers are constantly judging a product due to physical attributes before they even consume it. Expecting a certain kind of experience and receiving another can result in two outcomes, negative initial responses change to positive responses and a positive initial response change to a negative response. An example of a negative initial response can be seen in a popular children's book, *Green Eggs and Ham* by Dr. Seuss (1960). The dog-like character has negative emotions towards the physical green color he sees on the green eggs and ham that Sam I Am is trying to persuade him to eat. Sam I Am convinces the dog-like character to try the green eggs and ham and after he does, his original response became more positive when he discovers that he actually

likes green eggs and ham. Emotions can also have the opposite response seen in an example of buttered popcorn flavored ice cream. When looking at the physical attributes of the buttered popcorn flavored ice cream, it may simply look like a vanilla ice cream. A blind test subject may think the sample is vanilla and have positive emotional responses toward the product before consumption. After the first taste the subject will quickly discover that the sample is buttered popcorn flavored ice cream rather their initial expectation of vanilla. The emotional response to the product is now negative due to the unexpected consumption experience. These are just two examples that show how different experiences can cause a difference in emotional responses.

Consumers who have a positive emotional experience from food are more likely to purchase that product or similar products again. If sensory research can bridge the gap between emotional responses from the consumption of food, then many different industries can begin to understand more about consumer emotional experiences and better reach out to specific markets. Especially in the dairy industry, linking positive emotional experiences with dairy products would benefit the dairy industry as a whole.

### ***Purchase Intent***

Does emotional responses really show potential purchase intent? It is known that there are certain attributes in a product that make a consumer want to purchase it again, although those attributes may differ depending on the consumer need. Take chocolate milk for example, what are the attributes that make consumers consistently purchase one brand of chocolate milk over another? When comparing two products, one may be very thick with a rich chocolate flavor, contain high fat, sugar, and calories, whereas another brand may be thinner in viscosity with a less rich chocolate taste but have fewer calories, fat, and sugar with added protein. At what cost

is the consumer willing to purchase one product over another? Perhaps one consumer has more positive emotional responses to the lower calorie chocolate milk with added protein because they are trying to maintain a healthy lifestyle without completely giving up the luxury of chocolate milk. Another consumer may not want to sacrifice chocolate flavor and consumption experience because they have more positive emotions from the satisfaction of the full flavor and texture. The answer is unclear as to how emotions and likeness play an overall roll in purchase intent, although with more research in these areas it may be possible to piece together how consumers justify their purchases for dairy beverages.

### *Texture*

The dairy industry traditionally classifies products by the structure, texture, and viscosity required to meet the standard of identity. Standard of identity refers to product regulations set by the United States Department of Agriculture, which each class of dairy products is required to meet in order to legally labeled under a specific name (USDA, 2010). Texture goes hand in hand with the emotional experience of food consumption, hence it is also important to the sensory evaluation of products. Consumers purchase products with expectations that the product will satisfy them either physically or emotionally by the flavor, texture, or other attributes desired. A recent study (Hogenkamp et al., 2011) on the expectations of satisfaction from different flavored and textured dairy products has been able to give more scientific data specific to dairy products. They measured expected satisfaction from commercial yogurts, flavored custards, and chocolate milk. From the results, they concluded that the differences in texture consistently showed an increase of expected satisfaction of the products, regardless of the flavors. It is plausible that texture is an important attribute to dairy beverages although with few studies regarding emotion

testing and consumption of dairy products, it is still unclear how emotions and texture correlate in regards to emotional impact.

## **MATERIALS AND METHODS**

### *Designing the Experiment*

The following twelve pre-determined emotions were used as the base of the questionnaire: caring, excited, sociable, self-confident, silly, detached, fatigue, raging, judgmental, inferior, sad, and fear. Of the twelve emotions five were positive, two were neutral, and five were negative. A hedonic scale was used to measure overall likeness at the first, middle, and last taste. The test questionnaire was pre-designed and approved both by Cal Poly and Ohio State before continuing to find subjects. One hundred and twenty subjects were needed to complete the research and each recruited subject had to complete a screener questionnaire. All potential subjects who used Crest Pro Health mouthwash were not able to participate due to altered sensitivities from the mouthwash. Each chosen subject was assigned a homework assignment before arriving on the first testing day. This included finding personal or self-determined photographs of each of the twelve emotions to place on a poster board which was available on the first testing day prior to their entrance into the testing room.

Through the Compusense software, designated log in codes were generated each with letters to designate which type of tool they would be using to answer the questionnaire on that given day of testing. Randomized codes consisting of M, P, W, and C correlated with each tool such as, M for my poster, P for pre-determined photographs, W for emotion words, and C for the texture cards. The following code example, LPC025, would have signified that the subject would need to use the pre-determined photographs and the texture cards to answer the questionnaire for

that day. The texture cards and pre-determined photographs were designed and put together prior to the testing dates. The following dairy beverages were chosen as samples due to their differences in physical attributes: Danimals Strawberry, Horizon Organic Lowfat Strawberry Milk, Bolthouse Farms Protein Plus Strawberry, Chug Chocolate Milk Shake, Nesquick Lowfat Chocolate, YooHoo Chocolate Drink, and Silk Almond Dark Chocolate.

### ***Data Software Collection***

Compusense at hand software was used to efficiently collect data. This software was able to quickly gather all of the complex data and made analysis quicker and efficient. This also made sharing the data with a statistician much quicker.

### ***Preparation***

The study was conducted in quiet conference room at California Polytechnic State University's Dairy Products Technology Center in San Luis Obispo, CA and coordinated by graduate student Lauren Collinsworth, professor and advisor Dr. Amy Lammert, and two undergraduate students, Jess Thomas and Jessica Weber. The results of this study analyze only the dairy beverage section of the complete study, which also included carbonated orange beverages and convenience cheese. Sixteen laptop computers were placed with the Compusense sign in homepage on the screen. Subjects were not isolated during this test. The sample cups were pre-labeled with codes that correlated with the samples and questions on the Compusense questionnaire. The following codes were used for each product: Danimals Strawberry (653), Horizon Organic Lowfat Strawberry Milk (791), Bolthouse Farms Protein Plus Strawberry (864), Chug Chocolate Milk Shake (556), Nesquick Lowfat Chocolate (239), YooHoo Chocolate Drink (363), and Silk Almond Dark Chocolate (122). The dairy beverages were poured into the

corresponding sample cups, capped, and placed in the refrigerator to keep samples at a consistent temperature. A water cup, napkin, and a saltine cracker were placed at each computer testing station before each subject began testing.

### ***Execution of the Test***

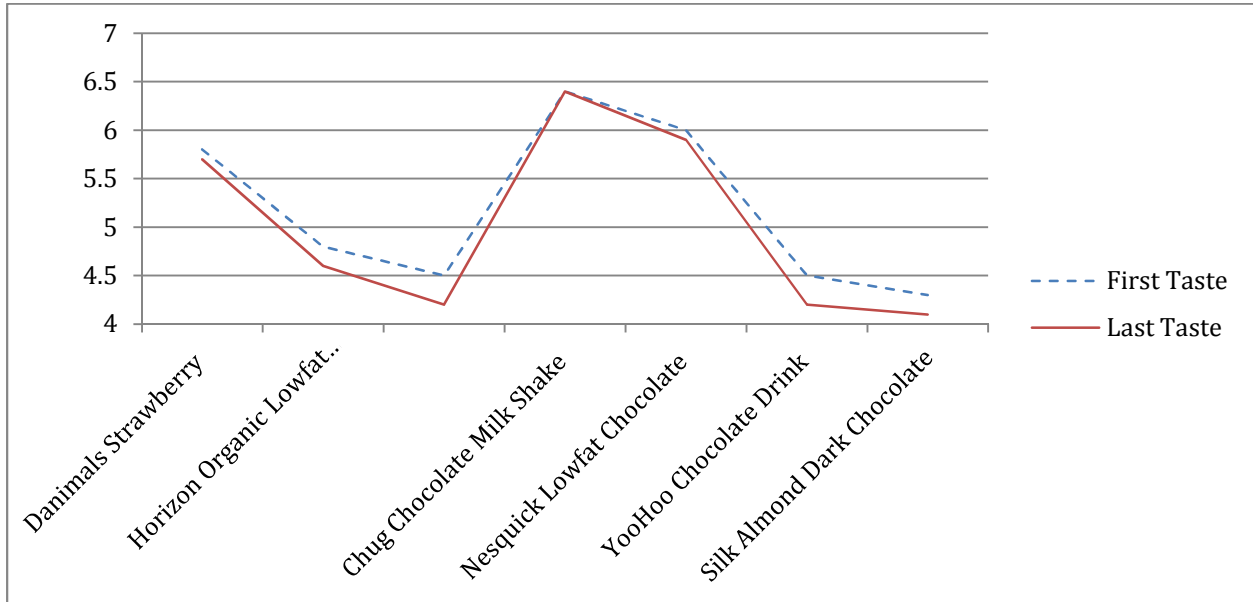
Before subjects were allowed into the testing room they had to check in at the front table and receive the tools that corresponded to their log in code. All seven samples were given to the subject at once because of the randomization of questions on the test questionnaire and to ensure a less distracted testing environment. The subjects were asked to record their emotional feeling prior to sampling, then again after they had finished the sample. They were also asked hedonic questions regarding each sample at the first taste, the middle taste, and the last taste.

## **RESULTS AND DISCUSSION**

There are many different ways to look at this statistical data, but only some of the most important points will be discussed in this analysis. The analysis is focused mostly on the emotions that are present when consumers experience dairy beverages and the trends of overall likeness of the product. This study hypothesized that a majority of these samples will show a trend of mostly positive emotions related to each product tasting experiences and that samples lower in fat and sugar would be indicative of more positive emotions and higher likeness scores from subjects. Also products with high levels of fat and sugar would be indicative of more negative or neutral emotions with lower overall likeness scores. Analysis of the data has actually shown the opposite in regards to the emotional responses after each product was consumed. These seven products were chosen because they have significantly different physical profiles and attributes which also contributes the differences to both overall likeness and emotional response.



Fig. 1 shows the differences in hedonic likeness from the first taste, shown by the dashed line, and the last taste shown by the solid line for each product. All of the products decreased in overall likeness except for the Chug Chocolate Milk Shake, which stayed the same.



**Figure 1.** Hedonic scale test results: Differences in overall liking from of first taste to the ending taste of the sample

### *Products*

The Chocolate Chug Milk Shake product showed the highest overall likeness and also the most positive emotional responses. This product also had the highest grams of sugar at 5.18 grams and 1 gram of fat per ounce. This may be because the subjects tested preferred the thick and creamy mouth feel that they get from the product or the intense chocolate flavor, which causes them to feel more positive emotions. Subjects were blind to the nutritional value of each sample and it would have been interesting to see if their overall likeness would have changed if the nutritional information were available to them. The least liked product overall was the Silk

Almond Dark Chocolate and was the only product that did not contain dairy. The calorie level was the lowest of all of the other samples with only 123 calories per serving although it had 0.37 grams of fat, the second highest of all the samples, and 2.71 grams of sugar per ounces oz. It was surprising to see that the overall likeness was so low since it has similar intense chocolate flavor to the Chug and was just as viscous. The difference from the first taste to the last indicated a decrease in overall likeness by 0.2 points relating to the hedonic scale (see Table 2). A few theories as to why the Silk Almond Dark Chocolate sample was ranked so low may be because it is not a dairy based product therefore it will not exhibit the same mouth feel. Although the product was thick it doesn't have the same physical attributes that natural milk fat gives when it is consumed. Subjects may also have a bias toward dairy products containing milk fat if they were expecting a certain mouth feel or taste commonly associated with products that are dairy based.

Chocolate and strawberry were the only two flavors of the seven products. Three products were strawberry flavored and four products were chocolate flavored. Overall trends based on flavor of the samples showed that chocolate seemed to have a much higher overall likeness and more positive emotional responses than did the strawberry flavored beverages. I believe this is because more consumers associate chocolate with milk when consuming dairy beverages and chocolate flavoring in general is already such a widely used flavor in a variety of dairy products.

**Table 2.** Hedonic scale results of overall likeness and emotional response differences from beginning of consumption to end

	Danimals Strawberry	Horizon Organic Lowfat Strawberry Milk	Bolthouse Farms Protein Plus Strawberry	Chug Chocolate Milk Shake	Nesquick Lowfat Chocolate	YooHoo Chocolate Drink	Silk Almond Dark Chocolate	Average
<b>Sugar</b>	4.5g/ 1oz	2.83g/ 1oz	2.46g/ 1oz	5.18g/ 1oz	3.43g/ 1oz	3.35g/ 1oz	2.71g/ 1oz	
<b>Fat</b>	0.16	0.308	0.246	1	0.308	0.129	0.37	
<b>Protein</b>	0.645	1	1.6	1.25	1	0.25	0.123	
Liking First	5.8	4.8	4.5	6.4	6	4.5	4.3	
Liking Last	5.7	4.6	4.2	6.4	5.9	4.2	4.1	
Overall Liking Difference Last-First	-0.1	-0.2	-0.3	0	-0.1	-0.3	-0.2	
X1 Caring	0.0%	-3.7%	-3.7%	2.7%	4.1%	-4.6%	-0.5%	-0.8%
X2 Excited	-1.8%	-13.2%	-5.9%	2.3%	-5.0%	-5.9%	-10.5%	-5.7%
X3 Sociable	0.5%	-3.7%	-8.2%	4.6%	2.3%	-4.1%	-5.9%	-2.1%
X4 Self Confident	-0.9%	-4.1%	-5.0%	-2.7%	1.8%	3.2%	-4.1%	-2.6%
X5 Surprise	8.2%	5.5%	3.7%	5.9%	5.0%	2.7%	3.7%	5.0%
X6 Detached	1.4%	-0.9%	3.2%	-2.7%	0.5%	2.3%	5.0%	1.2%
X7 Fatigued	-3.2%	-1.4%	-0.5%	-2.7%	-0.9%	-0.9%	4.6%	-0.7%
X8 Inferior	0.5%	-0.5%	0.0%	-0.9%	-0.5%	0.9%	-0.5%	0.1%
X9 Judgmental	-0.9%	8.2%	11.4%	-2.3%	-3.2%	7.8%	9.1%	4.3%
X10 Raging	-0.5%	0.9%	2.3%	-0.5%	-0.5%	1.8%	1.8%	0.8%
X11 Sad	0.5%	1.4%	3.7%	-0.5%	-1.8%	3.7%	2.3%	1.4%
X12 Fear	-1.4%	-2.7%	-1.4%	-4.1%	-2.3%	-1.8%	-2.3%	-2.3%
X13 None of These	-3.2%	1.4%	-2.3%	1.4%	0.0%	0.5%	0.9%	-0.2%
# Positive	1	2	5	4	3	4	5	
# Negative	2	5	5	5	3	4	4	
Total Emotional Change	3	7	10	9	6	8	9	

\* All shaded boxes are of significant value, containing a variability of 2.0%. Light grey shaded boxes indicate negative responses and dark grey indicate positive responses.

### *Difference Between Use of Words Versus Pictures*

Aside from the differences in overall likeness, it was interesting to discover that there were significant differences in emotional response depending on which tool was used to complete the questionnaire. When subjects were asked to use the defined pictures for their questionnaire, Bolthouse Farms Protein Plus Strawberry and YooHoo Chocolate Drink had the highest overall change in emotion. Both samples had more negative emotional responses. The Bolthouse Farms Protein Plus Strawberry sample made subjects feel judgmental whereas the YooHoo Chocolate Drink made subjects feel other negative emotions like fear and sad. When subjects were asked to use words as their tool to answer the questionnaire subjects tended to still have negative emotions, but not as large of a magnitude as the defined pictures indicated. When subjects were asked to use their own photos as the tool to answer the questionnaire, there was a decrease in the magnitude of negative emotions even less than when using words. There is very little research done on emotional responses to the consumption of dairy product testing using photographs.

### *Positive Versus Negative Emotions*

As was stated previously the positive emotions that were hypothesized to be seen from the consumption of dairy beverages were not valid for all the products. The majority of the products showed a much more negative emotional response after consumption. Table 2 shows the decrease in positive emotions overall along with the variability, which was a 2% difference. The highlighted portions show the most significant overall changes in both negative and positive emotions. There were three products that had the highest changes and those were Bolthouse Farms Protein Plus Strawberry, Chug Chocolate Milk Shake and the Silk Almond Dark Chocolate. The two emotions judgmental and surprise really stood out from the others in terms

of selected responses. Judgmental had the highest responses in the Bolthouse Farms Protein Plus Strawberry, Silk Almond Dark Chocolate, Horizon Organic Lowfat Strawberry Milk and the YooHoo Chocolate Drink. Judgmental was considered a negative emotion, although it can also be interpreted as a positive response to the product sample if the subject were to feel judgmental in a sense that it exceeded their original expectations. Surprise had the highest positive responses in all samples including the least like overall product Silk Almond Dark Chocolate. Like judgmental, surprise is a positive emotion but what cannot be determined from this data is in what way did the subject interpret surprise or judgemental.

When looking at each of these three products all of them can be considered alternative dairy beverages compared to natural milk products based on either their composition or the process in which they were pasteurized. The Horizon Organic Lowfat Strawberry Milk and the Silk Almond Dark Chocolate are both ultra high temperature pasteurized to increase the shelf life. Natural milk based samples were significantly more acceptable than the soymilk beverage sample. Villegas et al. also found similar results in their study of vanilla flavored milk beverages versus vanilla flavored soymilk beverages. When looking at the trends of samples that were higher in sugar and fat, subjects rated these products with more positive emotions such as surprise and sociable as well as higher overall degree of likeness. We can conclude that if the dairy industry can capture the emotional responses signifying surprise, caring, and sociable in marketing of dairy beverages, consumers may be more inclined to purchase that product again to fulfill those emotional needs. Overall the emotions tended to be more positive in the beginning of the test than at the end. This may be due to the length of the test signifying that towards the end the subjects were fatigued and detached from the samples thus recording less positive emotions and more negative and neutral emotions.

## **CONCLUSION**

Looking at both overall likeness and emotional responses of the seven sample dairy beverages and how these results can potentially relate to repeat purchases, it was concluded that emotions do have some impact on overall liking of a product although the data collection from this study is very broad and needs further investigation to determine specific results. The initial emotions prior to sampling were much higher than at the end of the test and only a few of the emotions were statistically significant to this study. This only supports further investigation to design a better test with more specific emotions that were significant to this study which can lead to more specific and precise data. A lot of general information was analyzed from the data results from Cal Poly and Ohio State, but more research testing needs to be completed on the population of people who are actually purchasing these products in the store rather than just collecting data from college students. Overall this study has given a good starting point on how emotion and overall likeness correlate to dairy products and more research in the future can lead to potential marketing strategies for dairy beverages using emotions.

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