

Arizona Nutrition Network Milk Taste Test

2008

Prepared by
Shelley Kuklish
Epidemiologist

September 2008

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Executive Summary

- The purpose of the Arizona Nutrition Network (AzNN) Milk Taste Test was to see if people are able to taste the difference between whole, 2% reduced fat, 1% low fat and skim/fat free milk, and that to see if people like the taste of 1% low fat and skim/fat free milk when they are unaware of what they are drinking.
- The taste tests were conducted with a convenience sample of 100 participants from 5 of the busiest State Supplemental Nutrition Program for Women, Infants and Children (WIC) clinics in the Phoenix Metropolitan area.
- Participants were given four samples of milk and were asked to identify the type of milk, and if they liked the sample.
- After the taste test, the participants were informed which samples they correctly identified and if they said they liked the taste of the 1% low fat or fat free milk.
- Participants were asked to fill out a separate demographic card, which was submitted anonymously in a separate box. Of the participants:
 - 28% were Hispanic White
 - 28% were Hispanic American Indian
 - 14% were non-Hispanic White
 - 30% were spread between the other race/ethnic groups
 - 54% completed a demographic card in English
 - 46% completed a demographic card in Spanish
 - 88% were female
 - 83% were between the ages of 18 and 59 years of age
 - 44% reported that their household received Food Stamp benefits
 - 3% reported that their household received Food Distribution program on Indian Reservations (FDPIR)
- Milk Taste Test Results:
 - Age was the only demographic characteristic collected on the survey
 - The average age of the participants was 26.7 years, with a range from 2 to 62 years.
 - Almost half (45%) of the surveys were conducted in Spanish.
 - Participants were asked to indicate if the statement “1% low fat and fat free milk have the same amount of vitamins and minerals as whole milk” was true or false.
 - Almost two-thirds (61%) of participants correctly answered that the statement was true.
 - Participants were also asked to indicate what type of milk that they usually drank, how much they drank and how often they drank it. Of the participants:
 - Half (49%) reported that they drank 2% milk
 - One-quarter (25%) reported that they usually drank whole milk
 - The majority (79%) reported that they drank milk daily
 - Participants reported consuming an average of 1.95 cups per day, with a range of 2 to 8 cups per day.

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- Participants were given four samples of milk to taste and were asked to identify each sample, and to indicate if they liked or did not like the sample. Of the participants:
 - 4% correctly identified all four samples
 - 20% did not identify any of the samples correctly
 - Participants were more likely to report that they liked the 1% low fat milk than any of the other samples.

- 1% Low Fat Milk Sample:
 - 22% of participants correctly identified the sample.
 - 88% of participants reported that they liked the sample.
 - Participants who drank 2% reduced fat milk were more likely than participants who already drank 1% low fat or fat free milk to have reported liking the sample.
 - As age increased, participants were more likely to report liking the sample.
 - There were no statistically significant differences in correctly identifying the sample by participant's usual milk type or age.

- 2% Reduced Fat Milk Sample:
 - 32% of participants correctly identified the sample.
 - 81% of participants reported that they liked the sample.
 - There were no statistically significant differences in correctly identifying or liking the sample by participant's usual milk type or age.

- Fat Free Milk Sample:
 - 38% of participants correctly identified the sample.
 - 49% of participants reported that they liked the sample.
 - As the age of the participant increased, they were less likely to have correctly identified the sample, but more likely to have reported liking the sample.
 - There were no statistically significant differences in correctly identifying or liking the sample by participant's usual milk type.

- Whole Milk Sample:
 - 37% of participants correctly identified the sample.
 - 74% reported that they liked the sample.
 - There were no statistically significant differences in correctly identifying or liking the sample by participant's usual milk type or age.

- After completing the taste test, participants were asked if they would be willing to switch to 1% low fat or fat free milk.
 - 66% of participants reported that they would be willing to switch to 1% low fat or fat free milk after completion of the taste test.

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- 4% of participants reported that they already drank 1% low fat or fat free milk.
- There were no statistically significant differences in willingness to switch by participant's usual milk type or participant age.

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Introduction

Research has shown that the perceived taste of low fat milk has been a barrier to consumption. A national survey conducted by the Caravan Opinion Research Corporation (1994) showed that 47% of respondents indicated that they do not drink fat free milk because they do not like the taste. However, the Center for Science in the Public Interest conducted blind taste tests and found that almost all consumers liked the taste of fat free milk, and 94% liked the taste of either 1% low fat or fat free milk. When consumers were presented with whole, 2% reduced fat, 1% low fat and fat free milk in a blind taste test; few could taste the difference between types of milk. Previous research has shown that more than one-quarter of consumers confused whole and fat free milk, and over one-third confused whole and 1% low fat milk. The results of this research shows that the negative attitudes about low fat and fat free milk are more in the mind of the consumer than their taste buds. Blind taste tests are an important tool in overcoming those negative attitudes. These taste tests provide consumers the opportunity to taste 1% low fat and fat free milk, and often find that they like it.

Methods

The Arizona Nutrition Network conducted 5 taste test events in the 5 of the busiest State Supplemental Nutrition program for Women, Infants and Children (WIC) clinics in the Phoenix metropolitan area. Table 1 shows the percentage of participants by clinic location. During the taste test events, WIC participants were asked to participate in a blind taste test to try the four different kinds of milk (whole, 2% reduced fat, 1% low fat and fat free) to see if they could taste the difference. This was done to see if many people are unable to taste the difference between milks. After trying all four milks, the participants were told which milk they guessed correctly and whether they said they liked the taste of 1% low fat or fat free milk. They were also asked to fill out a separate demographic card and were given a Fun Food News newsletter on low fat milk, which includes healthy recipes.

	Count	%
Glendale	32	32.0
Mesa	22	22.0
Maryvale	21	21.0
South Phoenix	14	14.0
Surprise	11	11.0
Total	100	100.0

A logistic regression model based on Fischer’s Scoring was used to assess if, based on the type of milk the participant usually drank, there were differences in the likelihood that a participant was able to correctly identify each sample, if they would like a certain sample, and if they were more likely to report willingness to change to a lower fat milk type. Age was the only demographic characteristic collected on the milk taste test survey, and therefore was the only demographic characteristic controlled for in the

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model. The comparison group was those participants who already used 1% low fat or fat free milk. All data was entered into Access and analyzed using SPSS 16.0

Results

Demographic Cards

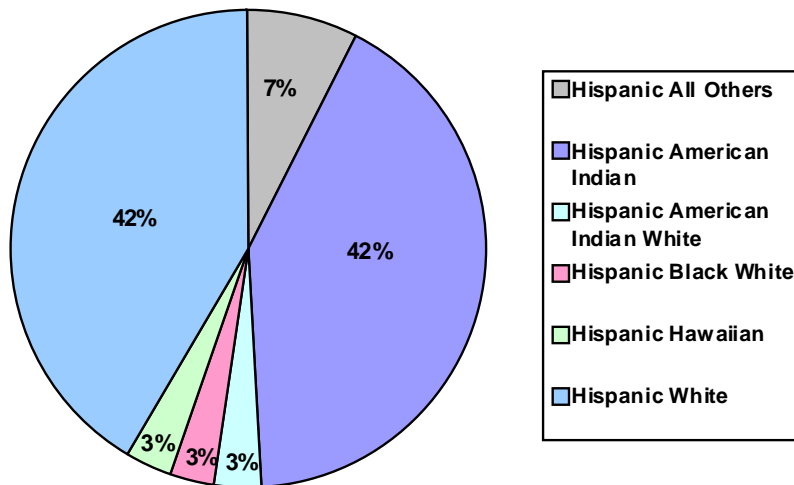
Race/Ethnicity

As demonstrated by Table 2, 28% of participants were Hispanic White, and another 28% were American Indian Hispanic, 14% of participants were Non-Hispanic White, 6% checked more than one box, and 4% did not report a race/ethnicity. The remaining 20% were spread between the other race/ethnic groups.

Table 2. AzNN Milk Taste Test Participants by Self-Reported Race and Ethnicity, Arizona 2008			
	Race/Ethnicity: Select only one	Hispanic	Non-Hispanic
One Races	American Indian or Alaskan Native	28	1
	Asian		
	Black or African American		4
	Native Hawaiian or Other Pacific Islander	2	2
	White	28	14
Multiple Races	American Indian or Alaska Native and White	2	1
	Asian and White		
	Black or African American and White	2	1
	American Indian or Alaska Native and Black or African American		
	All Others Reporting More than One Race	5	

As demonstrated by figure 1, for Hispanic participants, 42% of respondents were American Indian and 42% were White.

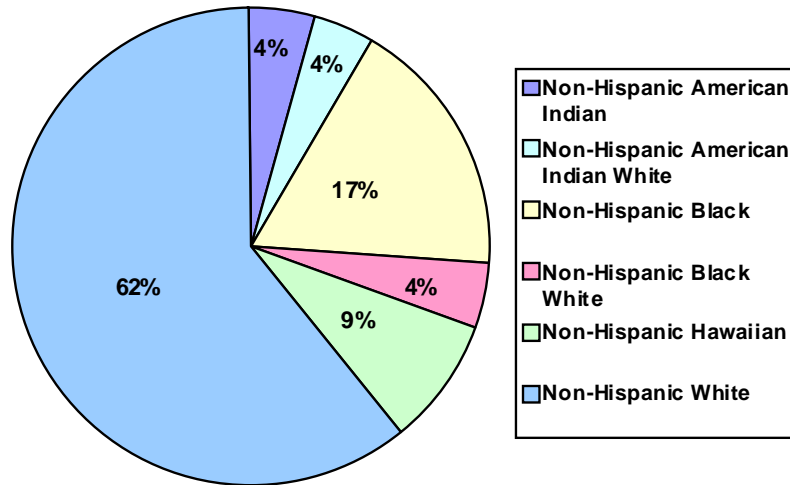
Figure 1. Hispanic Milk Taste Test 2008 Repondents by Race (n=67, 67%)



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As demonstrated by figure 2, for Non-Hispanic participants, 62% were White and 17% were Black.

Figure 2. Non-Hispanic Milk Taste Test 2008 Repondents by Race (n=23, 23%)



Geographic Location

Table 3 shows the reported zip code of residence of the participants. As Table 3 demonstrates, participants came from a variety of zip-codes, with no large clusters emerging.

Zip Code	Count	%	Zip Code	Count	%	Zip Code	Count	%
85008	1	1	85041	3	3	85301	9	9
85009	3	3	85042	1	1	85303	4	4
85015	4	4	85043	3	3	85305	1	1
85017	2	2	85051	6	6	85335	4	4
85019	2	2	85201	3	3	85339	1	1
85021	1	1	85202	2	2	85345	2	2
85027	1	1	85203	4	4	85363	2	2
85031	5	5	85204	4	4	85374	3	3
85033	1	1	85209	1	1	85375	1	1
85037	2	2	85210	2	2	85379	1	1
85040	6	6	85282	1	1	85392	1	1
Missing	13	13						
Total	100	100						

Language

Demographic cards were available for participants in English and Spanish. Just over half (54%, n=54) of the cards filled out by participants were in English, and just under half (46%, n=46) were in Spanish.

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Gender

The majority (88%, n=88) of participants were female. Ten percent (n=10) of participants were male, and two percent (n=2) did not report their gender.

Age

Table 4 shows the percentage of participants by age group. As the table demonstrates, the majority (83%, n=83) of participants were between 18 and 59 years of age.

	Count	%
0-4 years	4	4
5-17 years	8	8
18-59 years	83	83
60+ years	1	1
Missing	4	4
Total	100	100.0

Food Assistance Participation

Just under half (44%, n=44) of participants reported that their household received food stamp benefits, and three percent (n=3) reported that their household received Food Distribution Program on Indian Reservations (FDPIR) benefits.

Milk Taste Test Results

Demographics

Participants were asked to report their age in years on the milk taste test form in addition to reporting their age on the demographic card. The average age of the participants was 26.7 years of age, with a range of 2 to 62 years of age. One participant did not report their age on the milk taste test form. Almost half (45%, n=45) of the taste-tests were conducted in Spanish.

Knowledge

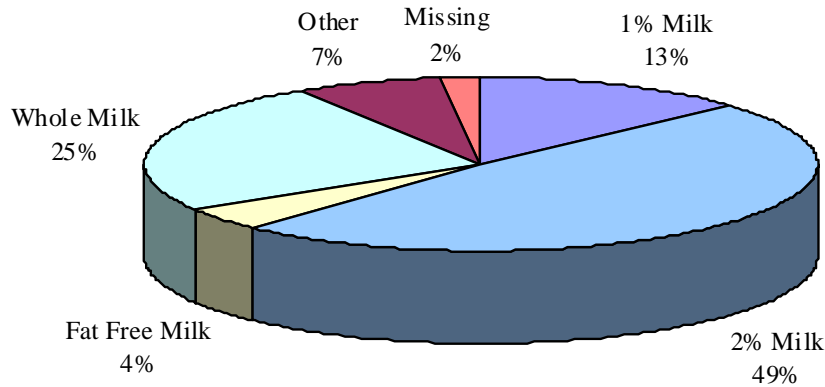
Participants were asked to identify if the following statement was true or false: “1% low fat and fat free milk have the same amount of vitamins and minerals as whole milk”. Almost two-thirds (61%, n=61) of respondents correctly responded that the statement is true.

Behaviors

Participants were asked to report the type of milk they usually drink. Figure 3 shows the percentage of respondents by the type of milk they usually drink. As the table demonstrates, half (49%, n=49) of participants reported that they drank 2% reduced fat milk, and another quarter (25%, n=25) reported that they usually drink whole milk.

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**Figure 3. Type of Milk Participants Usually Drink,
AzNN Milk Taste Tests 2008**

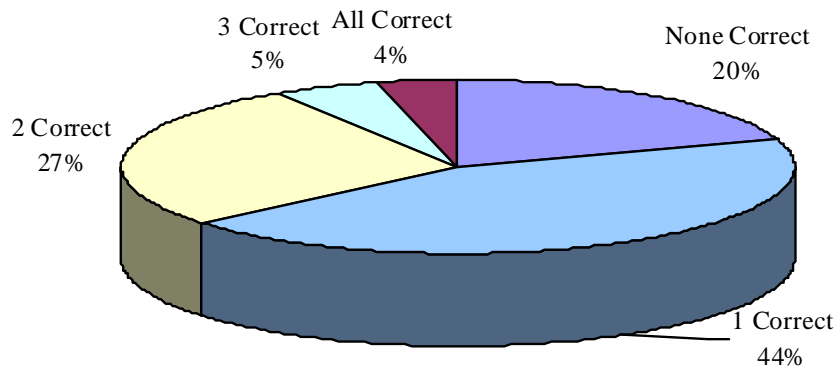


The majority (79%, n=79) of participants reported that they drink milk daily, and almost one-fifth (19%, n=19) reported that they drink milk weekly. One percent (n=1) of participants reported that they drink milk monthly, and one percent (n=1) reported that they never drink milk. Participants reported drinking an average of 1.95 cups per day, with a range of 2 to 8 cups per day.

Taste Test

As Figure 4 demonstrates, only four percent (n=4) of participants correctly identified all four samples. Five percent (n=5) of participants correctly identified three of the four samples, one-quarter (27%, n=27) of participants correctly identified two samples, and almost half (44%, n=44) of participants correctly identified one sample. One-fifth (20%, n=20) of participants did not correctly identify any of the samples. Participants were more likely (88%, n=88) to report liking the 1% milk sample than any of the other samples.

**Figure 4. Number of Correct Guesses,
AzNN Milk Taste Tests 2008**



Sample A- 1% low fat milk

Participants were given a sample of 1% low fat milk and asked what type of milk they thought it was, and if they liked or did not like the milk. Almost one-quarter (22%, n=22) of participants correctly identified the sample as 1% low fat milk. Over one-third (38%,

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n=38) identified the sample as 2% reduced fat milk, and almost one-third (29%, n=29) of participants identified the sample as whole milk. There were no statistically significant differences in correctly identifying by participant's usual milk type. The majority (88%, n=88) of participants reported that they liked the sample. Participants who usually drank 2% reduced fat milk were more likely than participants who already drank 1% low fat or fat free milk to have reported liking the sample (OR 8.1, p=0.0331). Additionally, as age increased, participants were more likely to report liking the sample (OR 1.1, p=0.0335). There was no statistically significant difference for participants who usually drank whole milk in comparison to those who drank 1% low fat or fat free milk.

Sample B- 2% Reduced fat Milk

Participants were given a sample of 2% reduced fat milk and asked what type of milk they thought it was, and if they liked or did not like the milk. One-third (32%, n=32) of participants correctly identified the sample as 2% reduced fat milk. Almost half (40%, n=40) identified the sample as whole milk, one-fifth (20%, n=20) identified the sample as 1% low fat milk, and six percent (n=6) identified the sample as fat free milk. There were no statistically significant differences in correctly identifying the sample by participant's usual milk type. The majority (81%, n=81) of participants reported that they liked the sample. There were no statistically significant differences in correctly identifying or liking the sample by participant's usual milk type or age.

Sample C –Fat free Milk

Participants were given a sample of fat free milk and asked what type of milk they thought it was, and if they liked or did not like the milk. Over one-third (38%, n=38) of participants correctly identified the sample as fat free milk. One-quarter (24%, n=24) of participants identified the sample as 1% low fat milk, one-fifth (19%, n=19) identified the sample as 2% reduced fat milk, eleven percent (n=11) did not know, and seven percent (n=7) identified the sample as whole milk. Half (49%, n=49) of participants reported that they liked the sample. There were no statistically significant differences in correctly identifying or liking the sample by participant's usual milk type. As the age of the participant increased, they were less likely to have correctly identified the sample as fat free milk (OR 0.9, p=0.0037), however were more likely to have reported liking the sample (OR 1.05, p=0.0345).

Sample D – Whole milk

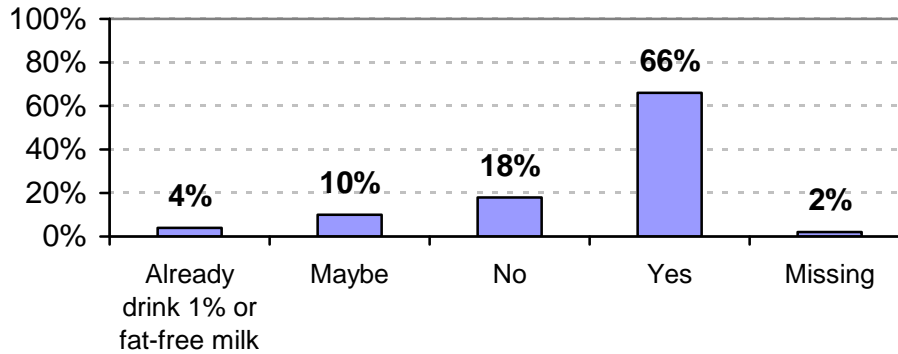
Participants were given a sample of whole milk and asked what type of milk they thought it was, and if they liked or did not like the milk. Over one-third (37%, n=37) of participants correctly identified the sample as whole milk. One-quarter (25%, n=25) of participants identified the sample as 1% low fat milk, 16 percent (n=16) identified the sample as 2% reduced fat milk, 14 percent (n=14) did not know, and eight percent (n=8) identified the sample as fat free milk. Three-quarters (74%, n=81) of participants reported that they liked the sample. There were no statistically significant differences in correctly identifying or liking the sample by participant's usual milk type or age.

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Willingness to Switch

As figure 5 demonstrates, two-thirds (66%, n=66) of participants reported that they would be willing to switch to 1% low fat or fat free milk, and an additional ten percent (n=10) reported that they might be willing to switch the type of milk they consumed after finishing the taste test. There were no statistically significant differences in willingness to switch by participant's usual milk type or age.

Figure 5. Willingness To Switch to 1% Low-Fat or Fat-Free Milk, AzNN Milk Taste Test 2008



Limitations

Because this study was not a longitudinal study, it is unknown if the switch to a lower-fat content milk was actually made. Additionally, the samples were not shuffled between participants, and while extra precautions were taken to avoid subsequent participants from hearing the answers to the taste-test, there is the possibility that there was contamination of the results. This was a convenience sample, so caution should be used when generalizing the results to the entire population of low-income individuals in Arizona. To further explore the results of this study, a study could be conducted in which sites are randomly selected throughout the state, as well as adding a control group. The ability to match the demographic information contained on the demographic cards to the surveys would have allowed for a more thorough analysis by allowing us to control for other external factors.

Conclusion

The purpose of the AzNN Milk Taste Test for 2008 was to see if people are able to taste the difference between milks, and if people like the taste of 1% low fat and fat free milk. The taste tests were conducted with a convenience sample of 100 participants from 5 of the busiest WIC clinics in the Phoenix Metropolitan area. Participants were given four samples of milk and were asked to identify the fat content of each milk, and if they liked the sample. After the taste test, the participants were informed which samples they identified correctly and if they said they liked the taste of the 1% low fat or fat free milk. Additionally, they were given a Fun Food News newsletter on low fat milk, which includes healthy recipes.

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Participants were asked to fill out a separate demographic card that was submitted anonymously in a separate box. Overall, 28% of participants were Hispanic White, 28% were Hispanic American Indian, and 14% were non-Hispanic White. The remaining 30 percent were spread between the other race/ethnic groups. Just over half (54%) of the participants completed a demographic card in English, and just under half (46%) were completed in Spanish. The majority (88%) of participants were female. Additionally, the majority of participants were between the ages of 18 and 59 years of age. Just under half (44%) of participants reported that their household received food stamp benefits, and three percent reported that their household received FDPIR. Age was also collected on the milk taste test survey. The average age of the participants was 26.7 years, with a range from 2 to 62 years. Almost half (45%) of the surveys were conducted in Spanish.

Participants were asked to indicate if the statement “1% low fat and fat free milk have the same amount of vitamins and minerals as whole milk” was true or false. Almost two-thirds of participants correctly answered that the statement was true. Participants were also asked to indicate what type of milk that they usually drank, how much they drank and how often they drank it. Half (49%) of participants reported that they drank 2% reduced fat milk, and another quarter (25%) reported that they usually drank whole milk. The majority of participants (79%) reported that they drank milk daily, with an average of 1.95 cups per day, with a range of 2 to 8 cups per day.

Participants were given four samples of milk to taste and were asked to identify each sample, and to indicate if they liked or did not like the sample. Only four percent of participants correctly identified all four samples. One-fifth (20%) did not identify any of the samples correctly. Participants were more likely to report that they liked the 1% low fat milk than any of the other samples.

For the sample of 1% low fat milk, almost one-quarter (22%) of participants correctly identified the sample, and the majority (88%) of participants reported that they liked the sample. Participants who drank 2% reduced fat milk were more likely than participants who already drank 1% low fat or fat free milk to have reported liking the sample. Additionally, as age increased, participants were more likely to report liking the sample. There were no statistically significant differences in correctly identifying the sample by participant’s usual milk type.

For the sample of 2% reduced fat milk, one third (32%) of participants correctly identified the sample, and the majority (81%) of participants reported that they liked the sample. There were no statistically significant differences in correctly identifying or liking the sample by participant’s usual milk type or age.

For the sample of fat free milk, over one-third (38%) of participants correctly identified the sample, and half (49%) reported that they liked the sample. As the age of the participant increased, they were less likely to have correctly identified the sample, but more likely to have reported liking the sample. There were no statistically significant differences in correctly identifying or liking the sample by participant’s usual milk type.

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For the sample of whole milk, over one-third (37%) of participants correctly identified the sample, and three-quarters (74%) reported that they liked the sample. There were no statistically significant differences in correctly identifying or liking the sample by participant's usual milk type or age.

After completing the taste test, participants were asked if they would be willing to switch to 1% low fat or fat free milk. Two-thirds (66%) of participants reported that they would be willing to switch to 1% low fat or fat free milk after completion of the taste test. There were no statistically significant differences in willingness to switch by participant's usual milk type or age.