

Effect of Raw Milk on Lactose Intolerance Symptoms

A Randomized Controlled Trial

Quyên Vu & Sarah Mummah
Mentor: Dr. Christopher Gardner

Background

Lactose intolerant individuals have diminished levels of lactase, an enzyme needed to digest lactose. After consuming lactose-containing food products (dairy), a lactose intolerant individual will often experience one or more unpleasant gastrointestinal symptoms, such as diarrhea, flatulence, or abdominal pain.

Most commercially available dairy milk is processed by pasteurization. In contrast, "raw milk" does not undergo such processing. Some individuals who believe they are lactose intolerant have reported experiencing fewer symptoms after drinking raw milk relative to pasteurized milk. The purpose of this controlled study is to determine whether there is objective validity to these anecdotal claims.

Methods

The primary initial inclusion criterion for this study was self-reported lactose intolerance with symptoms of medium severity. Participants included in this study were positive for lactose maldigestion by hydrogen breath test (HBT), which was defined as ≥ 25 ppm increase in H₂ from baseline over a three-hour testing period in response to consuming a standardized dose of 25 g lactose in solution after a ≥ 12 hour fast.

The on-study protocol included three 8-day milk phases (raw milk, pasteurized milk, and soy milk) in random order, and each was separated by a washout phase of 1 week. On days 1 and 8 of each milk phase, participants drank 16 oz of milk (the equivalent of 25 grams of lactose). On these days, an HBT was conducted over 4 hours at 20-minute intervals, and symptom logs were completed over the same 4 hours at 1-hour intervals. Additionally, on days 2-7, symptom logs were completed based on the most severe symptoms of the day. Milk was consumed on days 2-7 at progressively increasing volumes (Figure 1). HBT's were not conducted on these days.

Day (#)	2	3	4	5	6	7
Milk Consumption (oz)	4	8	12	16	20	24

Figure 1 (above). Study design: milk consumption for each milk phase on days 2-7 of the 8-day protocol

The study was a randomized, double-blind, three-way crossover trial.

Results

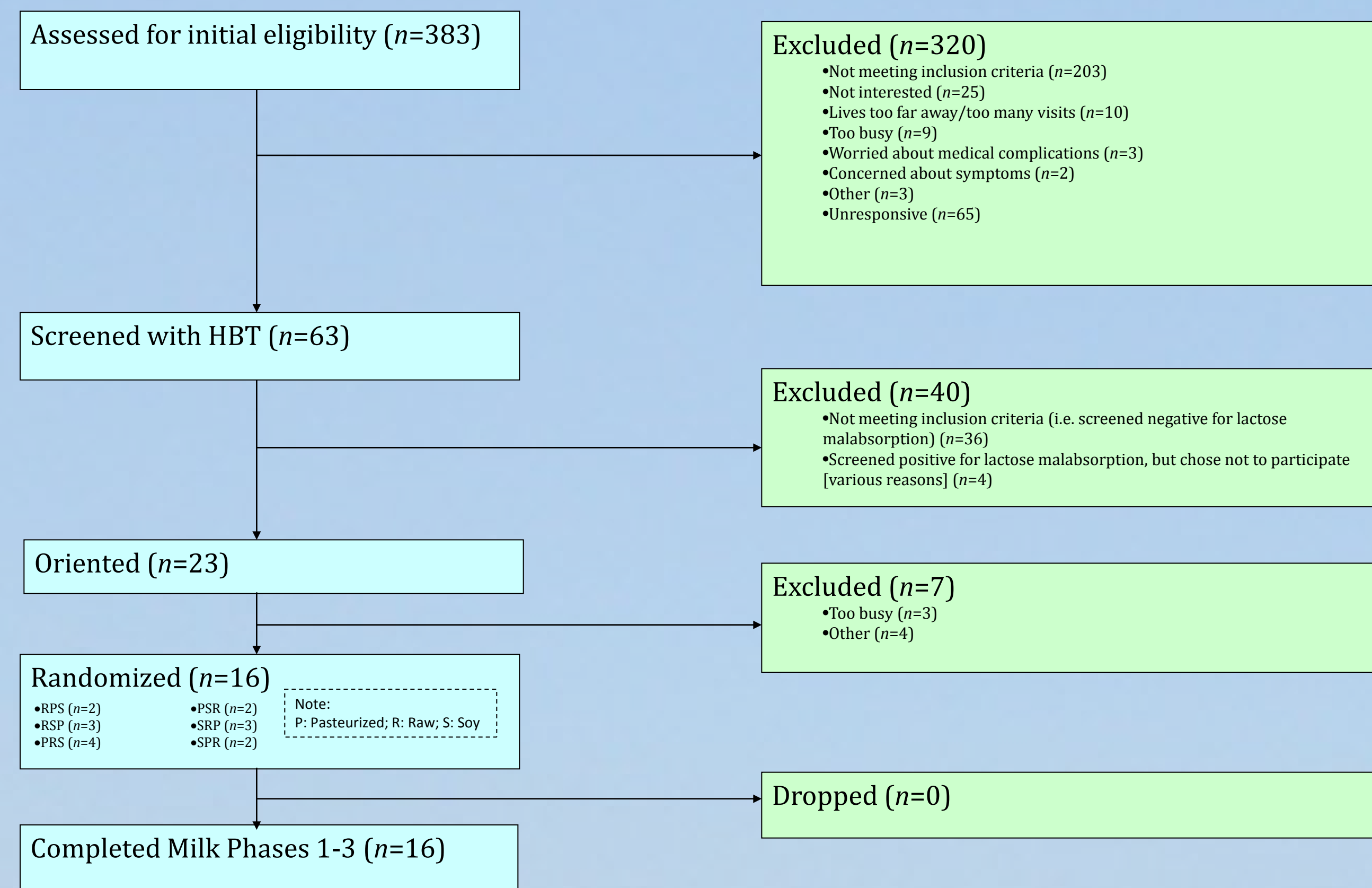


Figure 2 (above). Participant flow chart

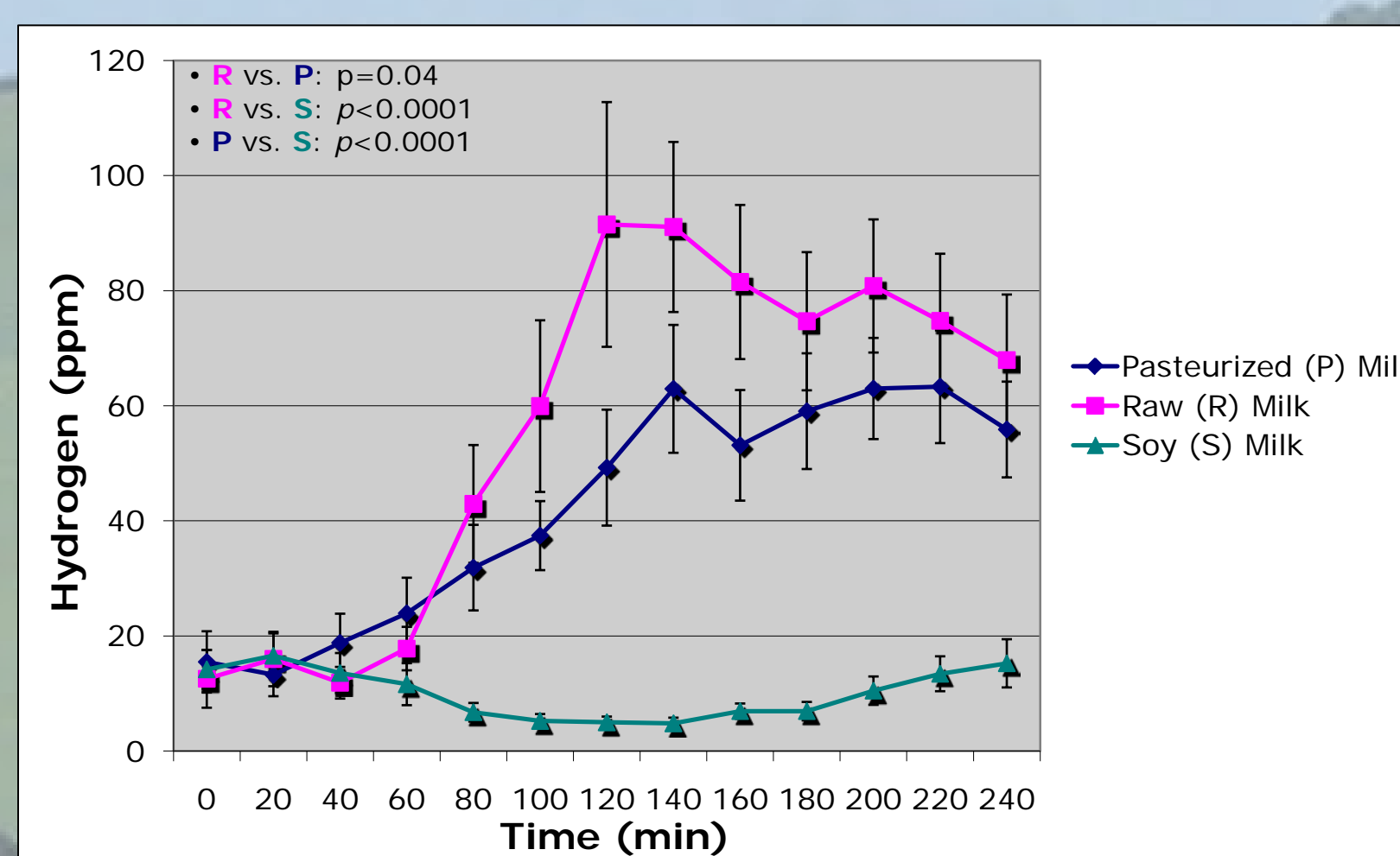


Figure 3 (above). HBT results day 1 (Mean \pm SEM) (n=16)

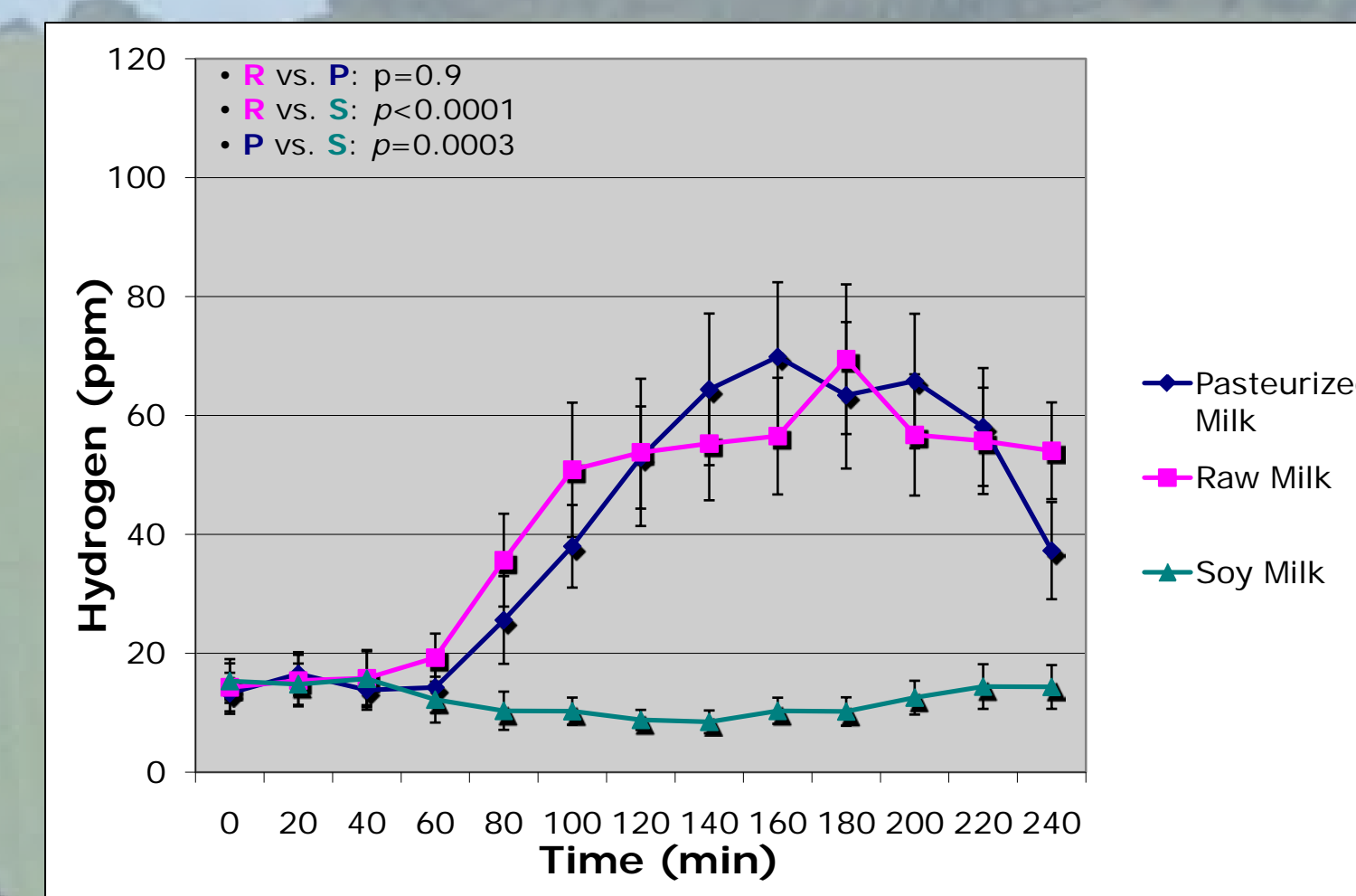


Figure 4 (above). HBT results day 8 (Mean \pm SEM) (n=15)
 *All data for one participant who did not undergo the day 8 HBT during the pasteurized milk phase were omitted from this analysis

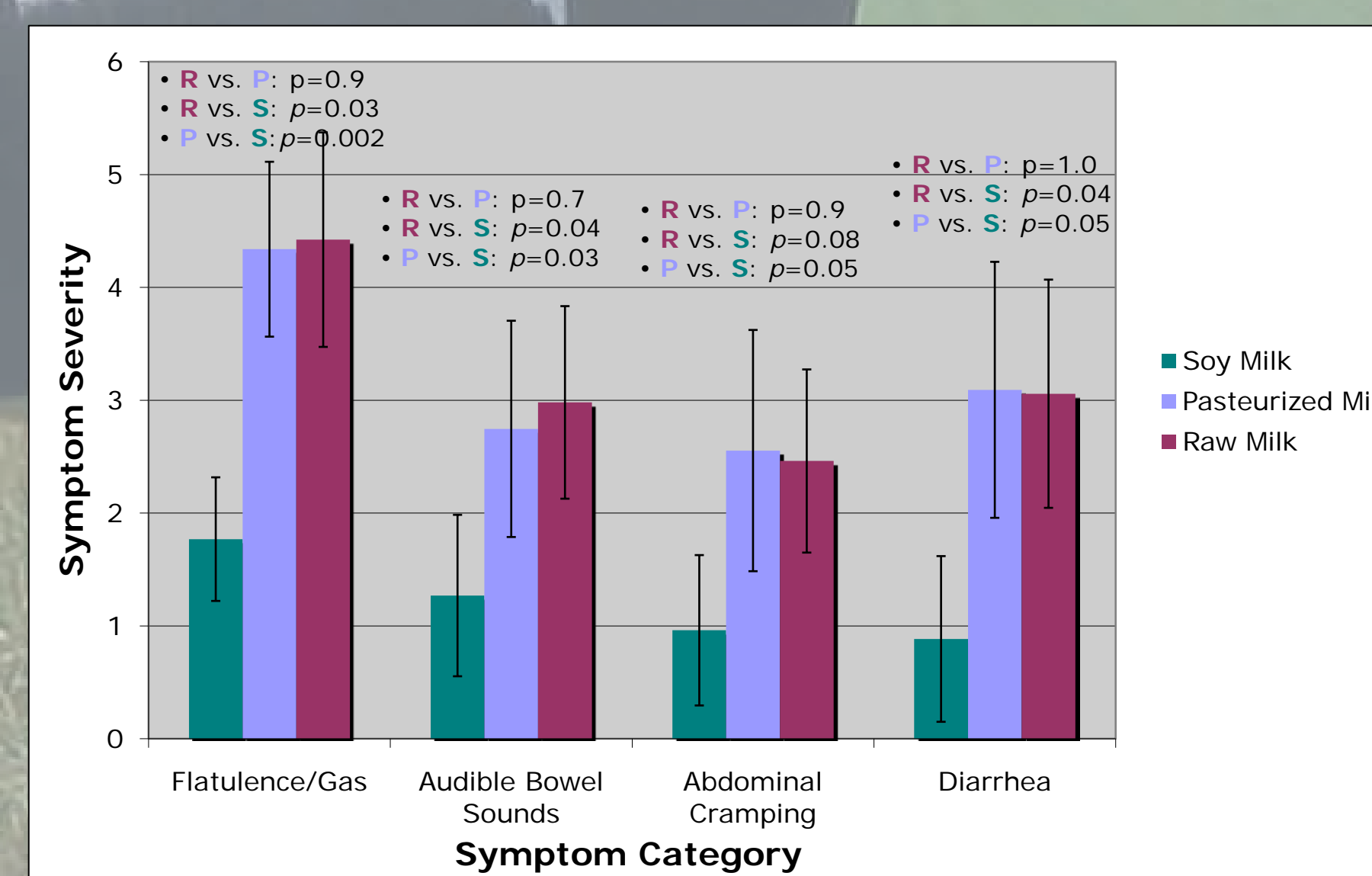


Figure 5 (above). Symptoms day 7 (24 ounces of milk consumed) (Mean \pm SEM) (n=13)
 *The data for the three participants who were each not able to complete one of the 24 oz doses were omitted from this analysis

Conclusions

An HBT was performed on day 1 and day 8 of each milk phase. Day 1 results did not support the hypothesis: consumption of raw milk resulted in borderline significantly higher hydrogen production relative to pasteurized milk. Similarly, day 8 results also did not support the hypothesis: there was no significant difference in hydrogen production between raw and pasteurized milk. There was a modest, non-significant trend toward acclimation (improved, lower HBT values) between day 1 and day 8 for raw milk.

Symptoms on Days 1 and 8 paralleled the HBT. No statistically significant differences were found between the reporting of symptoms for raw and pasteurized milk on days 1 or 8 (Data not presented). Thirteen of the sixteen participants were willing to tolerate 24 ounces of all three types of milk (day 7 of each protocol), and reported almost identical levels of symptoms while on the raw versus pasteurized milk. Consumption of raw or pasteurized milk led to significantly more severe symptoms than soy milk.

These results, collected under standardized and controlled conditions, do not support the widespread anecdotal claims by proponents that raw milk has benefits over pasteurized milk regarding the symptoms of lactose intolerance.

Implications

It is currently illegal to sell raw milk in twenty-two states in the U.S. Some staunchly believe in the benefits of raw milk while others decry its possible safety hazards. Claims that raw milk is well-tolerated by lactose intolerant individuals, as examined in this study, are unsupported and misleading for individuals with true lactose malabsorption. However, there are many potential health benefits associated with raw milk that remain to be tested in a similar objective, controlled study environment.

References

Suchy et al: National Institutes of Health Consensus Development Conference: Lactose Intolerance and Health. Annals of Internal Medicine; 152:792-796, 2010.

LACTOSE INTOLERANCE, HEALTH BEHAVIORS & RAW MILK, a thesis by Sarah Mummah

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