PRE-THICKENED BEVERAGE PRODUCTS FOR DYSPHAGIA DIET: SENSORY PROFILING AND EXTERNAL PREFERENCE MAPPING

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Introduction

- Dysphagia is a dysfunction of swallowing system which affect approximately 15 million of American population (Paik, Han et al. 2004).
- Patients tend to experience difficulty with having adequate nutritional intake and hydration(Germain, Dufresne et al. 2006)
- Thickened beverages are widely prescribed as a treatment to provide hydration(Terrado, et.al, 2001), but normally disliked by the patients(Lotong, Chun et al. 2003).
- Instant thickening agents are wisely used but have disadvantages like inconvenience and inconsistent, pre-thickened products can be alternatives.
- Sensory analysis is the study that describe people's perception of the flavor, texture, appearance and aroma of products.
- Sensory profiling helps researchers to determine the sensory characteristics of the products and understand how they affect patients' acceptance when sensory profiles combined with consumer study.

Objective

To compare sensory profiles and determine reasons for acceptance of honey and nectar thick commercial pre-thickened water products used for dysphagia patients in the U.S.

Materials and Methods

- Four commercial pre-thickened water products in two consistency (Honey and Nectar) were evaluated in this study

Table 1. Product information

Product	Consistency	Base	Flavor	Sample code
Hormel Health Labs Thick and Easy® Thickened HYDROLYTE® Lemon Water	Nectar	Starch	Lemon	Hydrolyte-N
Hormel Health Labs Thick and Easy® Thickened HYDROLYTE® Lemon Water	Honey	Starch	Lemon	Hydrolyte-H
Lyons Magnus ReadyCare™ Flavored Water	Nectar	Starch	Lemon	Readycare-N
Lyons Magnus ReadyCare™ Flavored Water	Honey	Starch	Lemon	Readycare-H
Hormel Health Labs Thick and Easy® Clear Thickened Water	Nectar	Gum	Lemon	Clear-N
Hormel Health Labs Thick and Easy® Clear Thickened Water	Honey	Gum	Lemon	Clear-H
Thick-it® Aqua care H2O Beverage thickened water	Nectar	Gum	None	Thickit-N
Thick-it® Aqua care H2O Beverage thickened water	Honey	Gum	None	Thickit-H

- Products were stored in refrigerating temperature 24 hours prior to the test and served between 7.2 and 11.6 Celsius
- The serving cups were placed in ice bathes to maintain the target temperature during evaluation to maintain target temperature.
- The flavor, texture, aftertaste and mouthfeel of the products were evaluated by a highly trained consensus descriptive panel.
- The viscosity of the products were measured with a Bostwick consistometer and line spread test.

Results

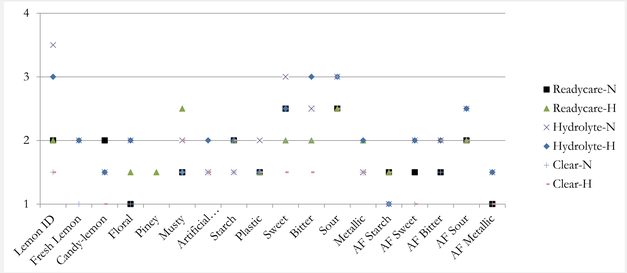

Figure 1. Flavor and aftertaste of lemon-flavored products

- All lemon-flavored products had similar flavor characteristics, except the Thick&Easy Clear had less lemon-related flavor than the others.

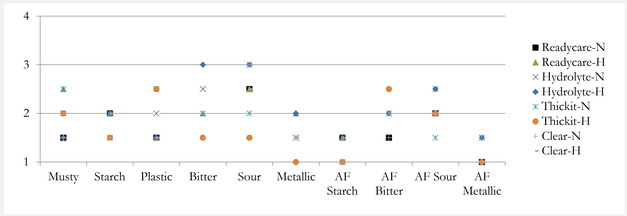

Figure 2. Base flavor of all products(exclude lemon-related attributes)

- After excluding the lemon-related flavor characteristics, all products had similar "base flavor" notes no matter if the product was starch-based or gum-based.

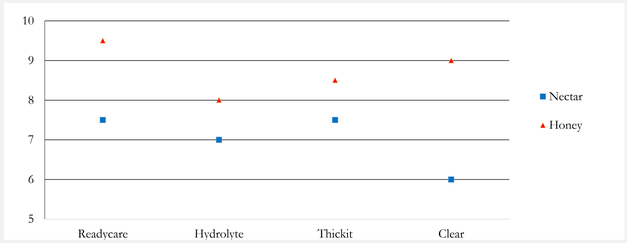

Figure 3. Viscosity of nectar-like and honey-like consistency of each product(descriptive)

- Unlike self-mix thickened beverage, no lumpiness or graininess detected in pre-thickened products.
- Most texture characteristics were highly correlated with the viscosity of the products.
- The texture of the products varied between nectar and honey thickness, but also varied among products that were stated to be at the same level of thickness.

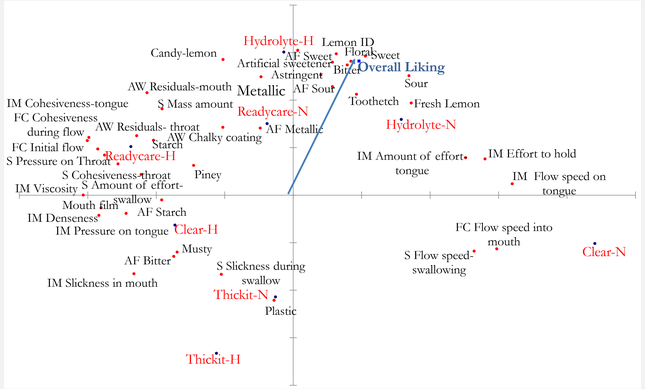

Figure 4. External Preference mapping

- From the external preference mapping, it shown lemon-related flavor and thinner texture are potential drivers of consumers' liking.

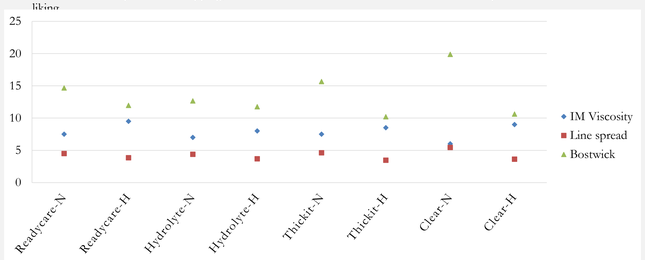

Figure 5. Viscosity measured with descriptive panel, Bostwick consistometer, and line spread test

- Instrumental data was highly correlated with descriptive data.

Conclusion

- Adding flavor and thinner texture tended to increase consumers' acceptance of pre-thickened products.
- Pre-thickened beverages are good alternatives for self-mix thickening agents but a standard for thickness should be agreed and used by manufactures.
- Instrumental data of viscosity can potentially predict sensory texture characteristics.

References

LOTONG, V., CHUN, S., CHAMBERS, E. and GARCIA, J.M., 2003. Texture and flavor characteristics of beverages containing commercial thickening agents for dysphagia diets. Journal of Food Science, 68(4), pp. 1537-1541

GERMAIN, I., DUFRESNE, T. and GRAY-DONALD, K., 2006. A novel dysphagia diet improves the nutrient intake of institutionalized elders. Journal of the American Dietetic Association, 106(10), pp. 1614-1623

PAIK, N., HAN, T.R., PARK, J.W., LEE, E.K., PARK, M.S. and HWANG, I., 2004. Categorization of dysphagia diets with the line spread test. Archives of Physical Medicine and Rehabilitation, 85(5), pp. 857-861.

Terrado, M., Rusell, C., &Bowman, J. (2001). Dysphagia: an overview. Megsurg Nursing, 10(5), 233-250. Retrieved from EBSCOhost.

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