



The Effect of Honey Addition on the Four Basic Tastes

Summary of a research project funded by the National Honey Board and conducted at the University of Georgia-Griffin.

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Summary

In a study conducted at the University of Georgia, the effect of honey on the four basic tastes was evaluated. Pure solutions of sucrose, citric acid, caffeine and sodium chloride were used for these experiments. Panels of trained evaluators were used for the sensory evaluation tests.

Enhancing Effect of Honey on Sweetness Intensity of Sugar Solutions

The addition of honey to sweet solutions enhances their sweetness intensity. The study showed that this effect was particularly noticeable for lightly sweetened products. For example, the addition of 25% honey to a 5% sucrose solution doubled

the sweetness intensity of the solution. Orange blossom and clover honeys were found to have the most enhancing power. When added to sweeter solutions (such as 10% sucrose solution), the enhancing effect was not as pronounced, but the intensity was enhanced most by orange blossom honey.

The use of honey as a sweetness enhancer would appear to be most helpful in lower sugar product formulations in order to increase the sweetness intensity of the product without incorporating too much sugar in the formulation.

Honey Can Decrease the Sourness of Solutions and Has the Potential to Improve Consumer Acceptability of Sour Products

To measure this effect, honey was added to citric acid solutions of varying concentrations. The perception of sourness was linearly related to the concentration of citric acid. The sourness intensity of a 0.08% citric acid solution was rated at 50 and the addition of 25% honey (clover, orange blossom or wildflower) decreased the sourness to a rating of 14-17. This effect was even more pronounced in very sour solutions (0.15% citric acid); the addition of 25% honey resulted in almost a 75% decrease in sourness (from 100 to 22-26).

This function of honey can serve to increase the acceptability of sour products such as yogurts and citrus beverages. For example, in Scandinavia, fermented dairy products are routinely formulated with honey for maximum consumer acceptance. Citrus- or berry-based products such as sport beverages or some cereal and bakery fillings will benefit from the addition of honey to the formula. Honey has the ability to decrease the sourness of the product without contributing too many simple carbohydrates and masking the flavor of the fruits. Honey is also a useful ingredient in a number of fermented or pickled products (such as vegetables); its addition has the potential to increase consumer acceptability of very sour products.

Honey Decreases the Bitterness Intensity of Bitter Solutions

With a few notable exceptions (such as tonic drinks), the acceptability of bitter products is low. Bitterness in food products is sometimes the result of molecular breakdown during processing and manufacture (such as the formation of bitter peptides) or it is associated with off-flavor development. The study measured the ability of honey to decrease the

perception of bitterness, using 0.08% and 0.16% caffeine solutions. It showed that honey is a powerful agent which can be used by food developers to decrease bitterness: the addition of orange blossom, wildflower or clover honey (25%) to 0.08% caffeine solutions decreased their bitterness intensity from 50 to 16, 21 and 3.2 respectively. Furthermore, the bitterness intensity of 0.16% caffeine solutions decreased from 100 to 27–34 when 25% orange blossom or wildflower honeys were added.

Product developers may be able to use this property of honey to improve consumer acceptability of sweet and savory products and mask the bitterness of some otherwise desirable ingredients.

Honey Modifies Saltiness Perception and Increases the Acceptability of Savory Products

Because of its carbohydrate composition, honey has the ability to decrease saltiness ratings. When added to 0.35% sodium chloride solutions at a 25% level, clover, wildflower and orange blossom honeys decreased the saltiness intensity from 50 to 18, 15 and 28 respectively.

Honey added to more salty solutions (0.7%) decreased saltiness intensity from 150 to 27–45. This functionality aspect has been taken advantage of for many years by manufacturers of salt-cured products such as ham or bacon: the addition of honey can mask the high saltiness intensity of these products. It may also serve to increase the acceptability of other savory products which require high levels of salt for processing or manufacture. Product developers may also want to use these findings to adjust the levels of salt added to food products when honey is added in significant amounts.