

# Prolongation of Satiety Effects in Food in response to the Global Obesity Problem

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## Initial position

Obesity is a global problem. Various action-plans from public health institutions exist but to meet the requirements of concerned persons directly, there is a strong need to develop innovative food products that additionally help reducing the obesity problem. One promising possibility is to develop functional food products that are purpose-built for the prolongation of satiety in humans, which consequently will lead to a lower intake of energy throughout the day.

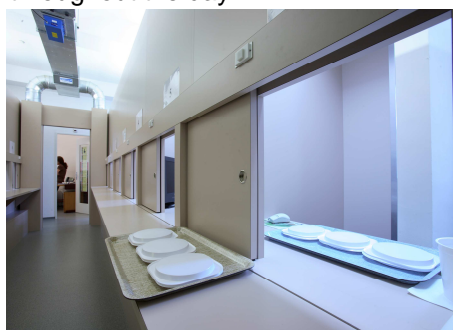


Figure 1: Sensory Laboratory at the ZHAW, Wädenswil

## Aim

Aim of the study was to provide first evidence for an enhanced effect of satiety in food in which normal flour-ingredients are replaced by a physical modified starch with slow-carbohydrates properties (no fibers).

## Material and Methods

Eleven healthy subjects participated at the study. Application of test products took place in the sensory laboratory at the ZHAW in the morning, after fasting for 10 hours. Subjects received a preload of test-products (biscuits) blind as standard food samples as well as enriched food samples. Blood glucose assessment and appetitive questionnaires were to be completed immediately before intake of the preload (0 min.), at 15, 30, 60, 90 and 120 min after ingestion of the preload. A parallel enquiry of the satiety status of subjects as well as sensory acceptance testing was done.

Not full at all (0) Very full (10)

Figure 2: Scale used for the assessment of satiety

Not hungry at all (0) Very hungry (10)

Figure 3: Scale used for the assessment of hunger

## Results

Regarding the means of the blood glucose values a tendency towards a lower increase of blood glucose level after consumption of enriched food samples compared to the increase after consumption of standard food samples was observed (differences between blood glucose values at 15, 30, 60 and 90 min significant at p-value < 0.05). The time course of blood glucose level after consumption of enriched food samples seems to be more steady as after consumption of standard food samples. These results are shown in figure 4.

The results of the evaluation of satiety show that the probands feel more full after consumption of enriched food samples as after the consumption of standard food samples (differences significant at 60 and 90 minutes at p-value < 0.05). These results are shown in table 1.

Regarding the sensory acceptance no significant difference between the enriched and the standard food samples was observed.

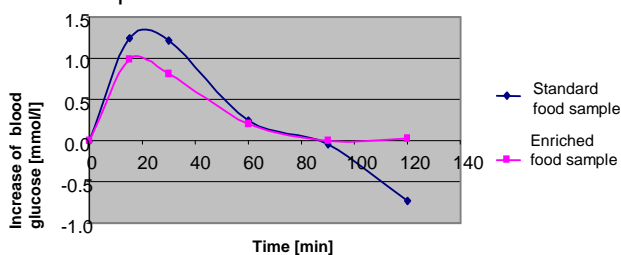


Figure 4: Increase of blood glucose

	Hunger min. 0	Satiety after intake of preload	Satiety min. 30	Satiety min. 60	Satiety min. 90	Satiety min. 120
p-value	0.206	0.137	0.140	0.049	0.004	0.657
Standard food sample	5.70	4.39	4.57	4.08	3.62	4.08
Enriched food sample	6.82	5.60	5.93	5.42	5.15	4.45

Table 1: Means of satiety resp. hunger assessment

## Conclusion

These promising results confirm the fact, that starch-based ingredients are able to prolong satiety in human through consumption of therewith enriched food. Further studies are needed to confirm results of the survey at hand. Beyond this, the application of identical and/or similar ingredients to other food products is imaginable, but for sure has to be verified in each single case.

## Keywords

Satiety, hunger, obesity, functional food, sensory, blood glucose, physical modified starch

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