

Sensory acceptance of organic and conventional food by children in the age of 2 to 7 years

A. Gieland¹, A. Hilbig², M. Kersting³, J. Kunert⁴, O. Sailer⁵, M. Busch-Stockfisch⁶

Key words: young children, preference, acceptance, organic food, breastfeeding

Abstract

This study is initialized to find out which sensory factors might influence the acceptance of organic food by young children. 138 children aged from 2 to 7 years were recruited at the German Research Institute of Child Nutrition in Dortmund. All these children are participating in the DONALD-Study. Detailed nutrition records are available about breastfeeding and feeding of these children from birth to the age of one and further on. In a 2-year testing-period children tasted organic and conventional food in two-sided Paired Comparison Tests. In both years parents were asked a number of questions, mainly about the nutrition behaviour of their children. Sensory tests were analyzed and connected in different ways: with data of sensory profiles, nutrition records and different questionnaires.

Introduction

Nowadays consumers are offered a wide range of organic food. It is of interest to find out which sensory factors might have an influence on the acceptance of organic food by children. This study focused on the age of 2 to 7 years. The objective of the present study is to identify a possible influence of breastfeeding and differences in weaning food (home prepared or industrial) during the first year of life on the acceptance of organic food at the current age. Other factors which might influence sensory acceptance like general liking and use of food, buying habits of parents and mothers' preferences during pregnancy will be discussed. This is the first study that combines eating habits in the first year of life and sensory testing of organic and conventional food with young children.

Materials and methods

A collective of 138 children in the age of 2 to 7 years were recruited at the German Research Institute of Child Nutrition in Dortmund. They all are participating in the Dortmund Nutritional and Anthropometrical Longitudinally Designed Study (DONALD-Study). Detailed data of these children are available about nutrition behaviour (nutrition records), growth, development, metabolism and state of health. Nutrition records at the age of 3, 6, 9 and 12 months show the nutrition behaviour of these children during their first year of life in detail.

¹Hamburg University of Applied Sciences, Department Oecotrophology, Germany; Andrea.Gieland@rzbd.haw-hamburg.de

²Research Institute of Child Nutrition Dortmund, Germany

³Research Institute of Child Nutrition Dortmund, Germany

⁴University of Dortmund, Department of Statistics, Germany

⁵University of Dortmund, Department of Statistics, Germany

⁶Hamburg University of Applied Sciences, Department Oecotrophology, Germany

Archived at <http://orgprints.org/10438/>

In 2005 and 2006 children tasted organic and conventional food in Paired Comparison Tests. This sensory method was chosen to find out preferences for organic or conventional grown food. Both years children were given organic and conventional grown samples of apples, carrots and wheat (as whole-grain rolls). All these food samples were obtained by the University of Kassel, Department of Food Quality, where sensory profiles of the samples were prepared. Other food samples, which were tasted, like milk, apple purée and orange-juice, were purchased on the market.

In the first year the children were aged from 2 to 6 years. In the second year the tests were repeated with the same and newly recruited children in the age of 3 to 7 years. In both years parents got questionnaires mainly with questions about the nutrition behaviour of their children, along with some questions about buying habits of parents and about mothers' preferences during pregnancy.

Four steps of evaluation were shown:

1. Preferences testing by two-sided Paired Comparison Tests.
2. a. Selection of Sensory Profiling data of pairs which were used in Discrimination Tests.
b. Analysis of this selected data by paired t-tests.
c. Significant attributes of Sensory Profiling were compared with preferences of Discrimination Tests.
3. Connecting Discrimination and nutrition data by logistic regression / likelihood ratio test, considering:
 - Quantity of breast-feeding and consumption of different types of weaning food (home prepared or industrial)
 - At age of 3, 6, 9 and 12 months (nutrition records)
4. Analysis of questionnaires with Fisher's Exact Tests, one-sided:
 - Different answers in relating to "child decision for organic samples"
 - Answers from mothers and children under aspect that the child prefers the same kind of food as the mother

All tests were made at significance level 5%, except for 2.a. where adjusted levels were used.

Results

In the preference tests for the fresh food samples only one significant result was found. There was a preference for organic apples from the second harvest year.

Considering the sensory profiling data there were two significant attributes for apples, harvested in 2005. One attribute for sour flavour and the other for firmness of fruit skin. Children tasted fruits without skin, therefore only the significant attribute sour flavour could be responsible for their decision. In the organic grown apples the sour taste was significantly lower than in the conventional one.

The results suggest that organic apples were preferred because they were less sour.

Relating the preferences to relative amount of breast-feeding, at age of 3, 6, 9 and 12 months, there was no significant correlation.

Two significant correlations with home prepared weaning food could be found:

- Correlation between preference of conventional wheat rolls (second harvest year) and high amount of home prepared milk-cereal-meal consumption at the age of 9 months was highly significant.
- Correlation between preference of organic carrots (first harvest year) and high amount of home prepared vegetable-potato-meat-meal consumption at the age of 12 months was significant.

Fisher's Exact Test did not show significant differences between preferences of the children and the child decision for organic samples. A significant result for carrots, from the first harvest year, was found between buying frequency of organic products and child decision for organic samples. Preference for organic carrots was higher for children whose parents bought more organic food. Comparing only questionnaires there are correlations between preferences of mothers during pregnancy and preferences of children for carrots in both years and for wheat rolls in the first year of testing.

Conclusions

Difference testing of preferences with children at the age of 2 to 7 years should only be applied if differences in samples are big enough. Questionnaires seemed to be a good possibility to get information about product use, general liking and buying habits. Evaluations showed that there are some interrelations between sensory acceptance, feeding in the first year of life, buying frequency and mothers' preferences during pregnancy. Many other connections with DONALD-data and answers of the questionnaire are possible and will be investigated.

Acknowledgments

Federal Agency for Agriculture and Food (BLE) - Bundesprogramm ökologischer Landbau - for financial support of this current study.

University of Kassel / Witzenhausen, Department of Food Quality, A. Plöger, M. Röger, Germany.

Institute of Organic Farming of the Federal Agricultural Research Centre (FAL), Trendhorst, G. Rahmann, Germany.

Research Institute of Organic Agriculture FIBL, F. Weibel, Switzerland.