

Project Report EatMe - I'm fancy

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The philosophy of a bowl of muesli

Variability

Muesli is a category of diverse foods rather than one specific product. There is an almost limitless freedom to combine different ingredients and to compose an individual mixture by adding or avoiding a specific foodstuff. It requires creativity and courage to design a new muesli, to combine flavors and textures of different ingredients to create an overall foodstuff that excites the taste buds and leaves the consumer satisfied. Each component is different from the others and has its own distinct attributes, and it is the unique combination of ingredients which defines the overall character of a muesli.

Consciousness

Nevertheless, taste is not the only criterion to consider. This is a general rule that is true for all foodstuffs we consume. We often base our selections on more ethical criteria too, for example, in order to make consciously considered and socially responsible choices. In addition to the taste, accordance with personal opinions and attitudes matter. Where does the product come from? How and how far was it transported? Is it a natural product or processed by industry? How much of the final price does the farmer earn? Was the product produced under organic and sustainable conditions? Considering these different criteria makes the composition of an ideal muesli more complicated or perhaps even impossible. There cannot be one ideal muesli which is healthy, affordable, socially and ecologically friendly and which contains all desired ingredients. Thus, a careful weighing and judging of many different factors is required to create a personal favorite mixture.

Universality

Muesli is universal. This undemanding foodstuff is simple and the preparation could not be easier, making it one of students' favorite foods. A package of premixed muesli or the ingredients in isolation can be stored for a long time without the risk of spoiling, which is ideal for those who do not have time – or who forget – to shop for fresh groceries on a regular basis. A bowl of muesli can serve as a full, satisfying and filling meal, supplying one with all essential nutrients. It can be a conventional breakfast or snack or even served as lunch or dinner. Muesli is known and valued by many cultures, each interpreting and preparing this universal meal in a unique way.

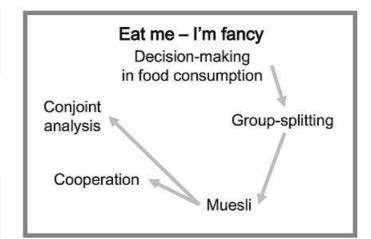
Muesli as a symbol for TUM students

The community of TUM members is highly diverse and heterogeneous. Students originate from countries all over the world, they have different sociocultural backgrounds, religions, attitudes and opinions, their interests and subjects of study range from agriculture to quantum physics – every person at TUM is unique and contributes to the harmony of our diverse community. This heterogeneity is reflected by our model foodstuff "muesli" which consists of a variety of different ingredients characterized by their unique taste, texture, price, origin etc. – together forming a harmonious composition.

The Philosophy of a Muesli Bowl

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Muesli as a symbol for TUM students

Abstract

Buying food is an everyday activity involving many decisions. We have never had so many options and possibilities when choosing our food as we do nowadays. Which factors play a key role when it comes to the final decision? The aim of our project was to analyze this question by concentrating on the muesli consumption of students at TUM. Using a "conjoint analysis," we were able to gain an insight into the priorities governing the choice of ingredients for making muesli specifically in relation to the categories of regionality, price, nutritional value, and organic certification. The results show some surprising characteristics and these should be of interest and relevance to further studies in this area.

Background

Shopping for groceries is a common activity which is part of our everyday life. On average, a German household spends over 10 % of all expenses on food (Statistisches Bundesamt, 2013). Globalization has provided us with an enormous diversity of products lined up on the stores' shelves. However, this diversity can be friend or foe: being given choices obviously forces one to make decisions and to choose certain products over others. Why do we add a certain foodstuff to the shopping cart rather than another? Certainly, this question cannot be answered easily, but we can make a reasonable guess at some of the numerous factors that might play a role in the decision-making process.

The recent trend toward health and fitness has put the nutritional values of foodstuffs into focus, in terms of, for example, protein content, fiber, calories and vitamins. Despite denials of the climate-change crisis by a few, awareness of a product's origin, transportation, sustainability and conditions of production is rising; keywords in this context are the ecological footprint, certificates, regionality and social responsibility. Besides all this, the shopping routine is influenced by less rational factors such as habits, curiosity or temptation. Whatever plays a role in one's decisions on groceries, this is a highly controversial topic, reflecting an individual's lifestyle and position on fundamental questions.

Based on this subject's high topicality and future relevance we decided to analyze the decision-making processes concerning food consumption in depth from theoretical and practical perspectives.

Therefore, a set of rational criteria, leading to a certain outcome, were defined and their importance was studied. For our analysis, we decided to concentrate on one specific foodstuff to allow for a precise investigation. Ideal targets are simple products which enable the consecutive variation of different parameters to determine the analyzed factors. After intensive research, we opted for muesli as our food of interest. Apart from being consumed among many different potential target groups in Germany, muesli is a composite foodstuff composed of several ingredients, thus enabling the separate investigation of each decision made when choosing each of these. With muesli, therefore, we were able to analyze many decisions while focusing on just one product. To allow for a more precise analysis of our initial question and to control the comparability of results, we decided to focus on a particular target group: students at TUM. This choice was determined not only by the fact that the latter represented an easily accessible group for us, but also by the high degree of heterogeneity of sociocultural background among TUM students.

Goals and methods

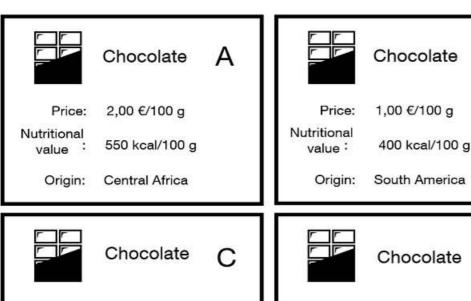
Muesli is a product composed of a variety of ingredients, each possessing its own characteristics. Each consumer might value these attributes differently according to, for example, individual taste, attitude toward costs, personal definition of healthy eating, and ethical views on fair trade. All these things can influence shopping behavior (Gensler 2006). The aim of our research was to determine the factors and characteristics which influence the decision-making of our fellow students most. Intensive analysis of the decision-making process and clustering of criteria yielded four general categories of attributes which we chose to concentrate on for further investigation: "regionality" "label/certification," "price" and "nutritional value". Those preferences were determined to produce a tailor-made TUMuesli, which represents the desires of TUM stakeholder.

The selection of a suitable method for our research involved a long process, led by practical considerations and studies on questionnaire-answering and self-assessment. To determine the most important decision-making factors, several approaches were discussed, such as the use of a questionnaire, a virtual model simulation, and an econometric model. Problems occurring in research fields when participants were asked to state their opinion on ethical topics have been described in the relevant literature. If par-

ticipants are asked directly whether they prefer a more expensive fair-trade product over a cheaper conventional one, most will state their willingness to buy the fair-trade one. The participants feel obligated to do so, even though they would behave differently in real life (Schöberl 2012). Thus, it is better to ask questions in which such ethical statements get rouged. A method to do this is the conjoint analysis which aims to measure the importance of individual factors without overtly asking about them, while still trying to resemble a realistic decision.

There are two general types of conjoint analyses: a choicebased one and a direct one. We used the latter one to design our conjoint analysis which asks the participants to rank a group of products according to their preferences. Since muesli is a composite product, we separated it into four general components: the basic substance, e.g. cornflakes or oats; milk; chocolate toppings; and dried fruits. For each of these sub-ingredients we designed a group of products using the orthogonal design algorithm of the statistics software SPSS. This was necessary to generate a smaller set of products that was still representative for all products and allowed the consecutive calculation of the importance of the individual factors from the data set. The products differed from one another in terms of the four characteristics of interest: "regionality," "label/certification," "price" and "nutritional value." In their product ranking, the study participants had, for instance, to decide whether they preferred a pack of organic oats from Germany for 4,95 €, or the cheaper but considerably less healthy option of corn flakes from USA.

В



Price:

Nutritional

value:

Origin:

2,50 €/100 g

550 kcal/100 g

South East Asia

Price: 1,00 €/100 g

Nutritional value: 550 kcal/100 g

Origin: South America

Figure 1: Decision example as part of a conjoint analysis

Using the generated ranking data of all participants, the conjoint algorithm of SPSS calculated the so-called "part-worth utility," which is a measure for the importance of each factor.

As an overall aim, we wanted to create a TUM-specific muesli mixture that represented the personal preferences and attitudes of TUM students. Therefore, we added a short survey to our questionnaire which asked for the participant's favorite muesli ingredients. By combining the data from the conjoint analysis that specify the most important characteristics for each sub-product with the results of the poll that determine the most preferred ingredients, we were able to generate a representative TUMuesli.

Outcome and Discussion

To assess students' decision-making about food consumption, a conjoint analysis with a questionnaire was designed. The analysis was based on the model foodstuff muesli, whereby the muesli ingredients of milk, cereal base, chocolate and dried fruit were considered. We administered the questionnaire using the evasys software to check our initial hypothesis:

TUM students take nutritional value, price, social and environmental factors into account differently when selecting their muesli

The survey was conducted over several weeks, allowing us to collect a significant and representative amount of data. A total of 122 persons participated in the survey. As visualized in Figure 1 the sex distribution was nearly evenly spread. Most of the participants were from the campus Innenstadt or Garching. Yet there were also several participants from Weihenstephan, Rechts der Isar and other campuses. Furthermore, the majority of the participating TUM students ate muesli several times per week, some even on a daily basis.

Asking participants questions about their consumer behavior helped us to understand the relative importance in their decision-making of our four chosen factors: origin, certification labels, price, and nutritional value per muesli ingredient. After processing the data, we were able to prioritize the different factors analyzed in the four examined muesli product categories, thus enabling a product-wide comparison. In figure 2 the results after the post-processing are shown.

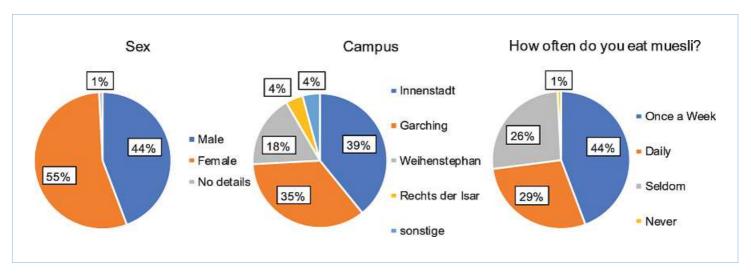


Figure 2: Left: Sex distribution of participants, middle: distribution between TUM campuses of the participants, right: muesli consumption frequency

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In accordance with the growing consciousness for an ethical lifestyle, we observed a high impact on decisions of the organic/fairtrade label and the origin of ingredients. TUM students especially preferred regional milk, if possible from the own federal state. Moreover, it was very important to them that the chocolate additive had a fairtrade label. Also for the cereal base and dried fruit the highest scoring factors were the origin and/or quality/organic label. Nevertheless, considering the economic status of students in



Figure 3: Importance per factor for the muesli ingredients milk, cereal base, chocolate and dried fruit

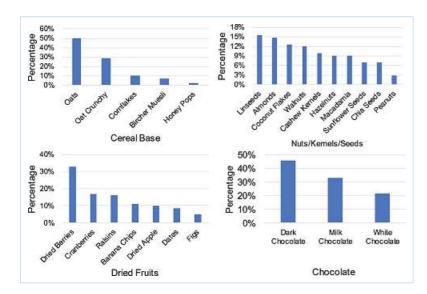


Figure 4: Results of the questionnaire

society, we also noted that the price was one of the determining factors on final decisions and was therefore evaluated as equally important for each ingredient. The importance of a regarded factor can vary significantly between different products. Moreover, all four components analyzed displayed highly diverse properties and may play different roles in everyday life.

Returning to our hypothesis, we can see that the four factors (origin, certification label, price and nutritional value) were evaluated differently. Hence, the investigated factors are not taken equally into account in the decision-making process of students when selecting muesli. This confirms our hypothesis mentioned above. In addition, we recognize, that the influence of the examined factors on the decision-making process might vary depending on the observed product.

Another important and not less interesting finding on the matter of the applicability of a conjoint analysis was that the ranking of products can be an exciting but also quite mentally exhausting endeavor. A dropout rate of approximately 60% of the participants indicated that it took a lot more effort to process a conjoint analy-

sis than a usual questionnaire. For future implementations of conjoint analyses, we would suggest carrying out the conjoint analyses in a lower volume with a more transparent structure so as to decrease the dropout rate.

By uniting the results of the conjoint analysis with the outcome of the upstream questionnaire (Figure 3 and 4) we were able to determine the composition of the TUMuesli as follows:

- Milk from Bayaria
- Oats from Germany
- Dark Chocolate with Fair-Trade Label
- Dried berries from Germany
- Regional almonds and linseeds

These results are not only valuable for the composition of the TUMuesli but also for companies of the food industry, as the importance of certain influencing factors in the decision-making process are illustrated. In particular the change of the utility values according to changes of the characteristic of a certain influencing factor might be of great interest. This can be very useful for decisions in marketing. For instance, companies could better define their pricing according to specific factors of consumer choice.

To conclude, the proposed composition of TUMuesli will be made available at the TUM shop and might also give existing food companies an incentive to produce a custom-made muesli for students.

Summary and Future Goals

The aim of the project was to gain an insight into the preferences of our fellow students and to determine which factors in their decision making are considered most. The result of this analysis is a muesli tailor-made to their desires. The conjoint analysis allowed us to achieve the latter as we were able to examine the decision-making processes of our fellow students and avoid bias due to indirect measurements of preferences. The data on

consumption clearly pointed out the significance of muesli in a student's diet. The results of our analysis served as a basis for creating the optimal muesli for TUM students. This is muesli to please the palates of all students: A careful composition of rich German oats, complemented by regional almonds and linseeds, with a serving of fine fair-trade dark chocolate and an intricate mixture of dried berries, all of which is completed by a healthy portion of wholesome Bavarian milk. A muesli fulfilling their desire for a satisfying meal, yet containing a dash of that something special that makes the TUMuesli a product that has been missing on their daily breakfast menu.

One of the most crucial things we learned was the importance of an appealing survey. This factor is critical keeping in mind the complexity of the conjoint analysis. An array of seemingly redundant questions can quite quickly irritate the survey taker. This is reflected by the high dropout rate in our survey, proving a need for a more appealing approach to designing the survey. Reducing the dropout rate must hence be viewed as one of the biggest goals for future projects which use the conjoint analysis as a method.

Lastly, we looked at the product itself. As aforementioned, the team created TUMuesli by combining the ingredients most favoured by TUM students. This recipe was subsequently sent to various cereal

companies who can market TUMuesli on a trial basis to judge the success of the product. These samples will be sold in the TUM shop to provide access not only to all students but also to visitors wishing to try the product. The trial run in market conditions will serve as a benchmark for the quality of the product. A positive initial response will lead to the addition of TUMuesli to the regular stock of the TUM shop. This way, everyone will be able to enjoy this healthy and satisfying muesli.

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Poster 1: Annual Conference 2016

Poster 2: Evaluation Day I

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JANUARY 2017





Poster 3: Evaluation Day II

Poster 4: Annual Conference 2017