



# Project Report Foodture

**Team**

- Andreas-David Brunner
- Christian Grätz
- Franziska Hauler
- Benedikt Josef Oberndorfer
- Fabian Schmitz
- Mareike Spindler

**Tutor**

- Maximilian Biebl
- Carolin Thiem

**Mentor**

- Prof. Dr. Alwine Mohnen
- Prof. Dr. phil. Ruth Müller
- Dr. Hannes Petermeier
- Prof. Dr. (em.) Peter Wilderer



Watching the clock: It is already past 9 pm. Five people are sitting in the kitchen. Everyone is exhausted and hungry. Everyone is full of hope and excited for what happens next. On that day we attended classes, worked hard, learned extensively, studied productively; headed home to pack leftovers found in our fridges we knew exactly we would not process on daily basis anymore and hurried to the meeting point. We met at a team member's kitchen starting to prepare a nice dinner. As we are sitting here, three hours have passed since we met; three hours of washing and chopping ingredients, discussing the most different issues and – incidentally once in a while – enjoying the fact that no food was wasted. Eventually we conjured up a fantastic three course menu – just for us – and now we are finally ready to enjoy it.

Our project-group “Foodture” is based on the ideas that we discussed at the very beginning of the Project Year 2015, last summer. As we tried to examine food wastage as a problem, we realized that we could also focus on our own attitudes in the first place rather than pointing at others. Many discounters sell fresh vegetables in sizes that a sole student would not be able to finish them in time. The two-kilogram bag of potatoes is an outstanding example, as the likelihood that more than half of it will remain unconsumed and finally be forgotten is very high – just until a moldy smell reminds one of its existence, and suddenly one is confronted with the cheerful sight of primary fine potatoes presenting themselves littered with sprouts over their former immaculate skin. Does this sound familiar to you? After experiencing such a scenario repeatedly, it is not surprising that the majority of people decides to take the more convenient option of choosing food which is always available, quick and cheap: Fastfood. Two thirds of men and 50 percent of women are already overweight. Should we just stand back and keep watching this happen? Or should we seek for alternatives?

That evening, our group began with a starter dish of mixed salad and fruity toppings made of banana and apple. “I never would have made a salad like this for myself”, said one of the group members. “This is something completely new for me – combining salad and fruits. What a great idea!”, another one added. The salad made us strive for more. In this case, more costs actually less, because the only thing we had to buy additionally for the salad was fresh lettuce. Total costs: 75 Cents. More people cutting salad made it faster and easier for everyone. On top of that, giving each other

advice about different cutting techniques, the kitchen might quickly become a healthy, simple and social environment for everyone.

In Korea, a survey among students indicates that students who live alone tend to eat fast and easily prepared food, while the ones who share a flat are more likely to cook fresh food as a ritual of coming together. If you consider your daily train ride to work or school for a second, one of the first images entering your mind might be people eating their croissants and sipping their take-away cappuccinos being somewhere lost in their own thoughts. Obviously, spending some time together while eating is not a popular trend anymore. In today's fast-paced world, it is simply not possible anymore to have three-hour brunches with your beloved ones every day. Everybody knows the challenge of having enough to eat while time is lacking once more and then we also are grateful for having the opportunity to grab some food along the way. Importantly, one must not forget the social aspects doubtlessly inherent in traditional food consumption. As an alternative to fast food, emphasizing on the old forgotten social aspect, we thought about starting frequent social-cooking events. As the German philosopher Georg Simmel once said: “The thing that people have in common most is the most obvious thing: the need to eat and drink.”

Talking of common things, during our cooking event it was the joy glistening in everyone's eyes when the dessert was served: Kaiserschmarrn with an apple-pear mousse, followed by a main course which took all of us on an undiscovered, gustatory journey. Swedish potatoes and turkey schnitzel scalloped with tomato and gorgonzola cheese. Both baked in the oven. Both untried before. Both dishes we never would have prepared on our own, we all agreed.

We, of course, also agreed on the fact that such cooking evenings cannot be enjoyed every day. But is that really our main concern? We want to focus on cooking fresh meals together in a warm-hearted social environment, on the idea that everyone contributes leftover ingredients saving money and reducing wastage. Having fun and cooking together, inspiring each other and enjoying the whole event.

## Abstract

In today's society, health and efficiency have a higher priority than ever before, since people are increasingly falling back on unhealthy and expensive nutritional solutions. We, as the members of "Foodture", set ourselves the mission to challenge this trend by organizing social-cooking events, so that the participant's body and soul benefit from this unique experience.

## 1. Background

Every year, 11 million tons of still consumable food gets wasted. Each and every individual can be part in changing this since 61% of that food ends up in the household's garbage. The fact that a huge amount of our food is discarded should be concerning to everyone – not only for ethical, but also for financial reasons. The yearly costs per citizen buying food which is never consumed is worth of 235 euros. [1]

At the same time, while eating together has become old-fashioned, eating alone has become a general new trend. This tendency has developed especially among students, because most of them either do not live with their parents or do not have their own family yet.

*"[Sharing meals] hints at commensalism being valued as a universal cross-cultural human trait. Rapid changes of lifestyles and food environment now make eating commensally more difficult (...)” [3]*

A study led by Korean scientists covering 250 male students has shown that the ones who eat alone choose healthier food. They prepare less fresh meals for themselves, eat less fruit, but instead buy more ready-to-eat meals or soup. Surprisingly, they gain 400 kcal less than the ones who eat together. However, no subject exceeded the recommended daily amount of calories. [2] An eight-year study covering about 40,000 Thai people has shown that eating alone and being unhappy are related to each other. [3]

Nowadays, it is not that easy to influence the eating behaviors in a positive way since our environment limits us in our own freedom of decision-making stronger than we might notice. The social and cultural norms, the supply from the food industry or the availabil-

ity of food in our environment play an important role such as the influence of our family and friends. Our decision matters only after considering all these influences. [4]

A study of the Federal Ministry for Food, Agriculture and Consumer Protection stated that women see themselves as better cooks than men, can do it, but the difference is far less distinct between students (19-34 years) than in the older population. [5]

The project group "Foodture" combined its awareness of this important topic with a mission, which aims to reduce the waste of food and build a common sense to consume meals in a social environment.

## 2. Goals and methods

The initial goal of the project was to encourage a reduction in wasting food. In parallel to this we also aim to support healthy nutrition whilst raising awareness of the social aspects inherent in consuming food. We decided to organize "Cooking Events" approaching our goals after a thorough discussion about the security of food supply, which was considered mainly under the topic "Transformational process." Organizing cooking events comes along with abandoning other promising ideas such as the placement of "ugly fruits" on local marketplaces or the establishment of shelves or fridges allowing an exchange of unconsumed food.

To realize our goals we considered a variety of solution strategies in the beginning which can be split into three categories. The first category focuses on the process of food production. Here, it is important to focus future food production processes, because our concern is to find healthier and more efficient means of nutrition and food production for future generations. Urban farming and the implementation of underwater green houses are some examples of possible future developments within this category.

The second category is focusing more on the food-wastage caused by a growing throwaway society. Here, we developed the concept of a special storage rack in supermarkets to redirect the unwanted "ugly food" into the value chain. The term "ugly food" refers to those vegetables and fruits that cannot be sold in the shops because they seem unattractive. A related idea in this category might be the establishment of commonly accessible fridges

in public areas. These fridges would allow for the exchange of food by people, who for example go on holiday and are not able to finish a product before it expires.

The idea of a common fridge led us to our third and final category: Enlightening society about nutritional facts. Here, we dealt with the challenges facing our society and the social aspects of nutrition, which brought us to the main block of our project.

To test the influence of society on nutrition we decided to develop a strategy of “Social-cooking-events”. We aim to examine the positive effects of social-eating on our habits.

Our website [www.designyourfoodture.de](http://www.designyourfoodture.de) serves as a contact point for people who want to have access to additional information or to register themselves for scheduled events. These events are intended not only to bring people together but also to help them overcome their individual challenges in the kitchen by cooking together. For every event, we covered different topics or tasks such as picking a specific international cuisine or buying groceries only with a given budget.

A huge advantage of these events is that one can automatically fight against food wastage. The participants can bring their leftover food. By leftover food we mean unused ingredients that are unlikely to be finished by a single person, but whose unnecessary disposal can be avoided by pooling them to create a shared with others.

An experimental event was conducted by our group members to calculate the costs and development expenses of such events.



The aim of this evening was to produce a three-course menu for a total of five euros per person. Participants were free to use their own unconsumed products as ingredients.

At the beginning of our event-experiment, every participant brought something from their own kitchen, which they would not have used their own.

At this point the question arises how to use the collected food and how to combine it to create a nice meal. As the variety and quantity of ingredients increases, it becomes harder and more time-consuming to make a final decision about what to cook. Therefore it has to be noted that it would be helpful to provide a clear framework of ideas for specific meals for future events.

For the event-experiment, the project team finally agreed to prepare the following menu:

- 1. Appetizer:** A basic mixed salad with apple and banana slices
- 2. Main course:** Oven-baked chicken breast fillet with tomato and Gorgonzola cheese Swedish potatoes (side dish)
- 3. Dessert:** Kaiserschmarrn



Only a small amount of extra ingredients had to be bought for this menu, such as the meat and Gorgonzola cheese for the main course. However, after dividing the total worth of additionally bought groceries between the number of participants, we figured out that none of us paid more than 2.20 € additionally, which fulfilled our expectations to not exceed five euros per participant.

*"That is totally a new thing for me! I never thought of putting fruits into a salad."*

The most important success of our evening was the fun we experienced from cooking together. After deciding on the menu, we quickly distributed the tasks evenly so the plates were soon filled with the first dish.

Cooking as a team did not take very long, but when it came to eating, we certainly took our time and discussed about different things concerning the meal.

We ate delicious food, laughed a lot and enjoyed the self-brewed beer of one of our team members. This evening was a great success for all of us.





## Recipe for the main course:

### Baked chicken breast fillet with tomato and gorgonzola

#### Ingredients for main course

Amount	Ingredient
600g	Chicken breast fillet
1 Tablespoon	Salt
1 Tablespoon	Pepper
2 Tablespoons	Olive oil
4	Tomatoes
150g	Gorgonzola cheese

### Swedish potatoes

#### Ingredients for Swedish potatoes

Amount	Ingredient
200g	Crème fraiche
200g	Sour cream
400ml	Meat broth (Very strong)
1kg	Potatoes
50g	Butter
75g	Smoked ham
5 slices	Toast bread
1 Tablespoon	Rosemary (Fresh needles)

#### Preparation

1. Cut the chicken breast into slices, season them with salt and pepper and sear both sides in oil, then put them in a baking tray
2. Cut the tomatoes in slices, season them with salt and pepper and spread them on the chicken slices.
3. Cut the cheese in thick slices and spread them on the tomato slices
4. Bake the pieces in a preheated oven (200 °C) for 15–20 mins, until the cheese melts

#### Preparation

1. Mix sour cream and Crème fraiche with the meat broth and fill a big oven dish with the mixture.
2. Cut the washed potatoes many times into thin slices so that the potatoes have deep cuts but stay as one piece. The distance between the cuts should be as long as the cuts made by an egg-slicer.
3. Put the potatoes in the oven dish so that their open-side is on the top and stand next to each other, but not on each other so that they can all be bedded in the sauce mixture.
4. Bake them for 45–60 mins, until the potatoes are almost cooked.
5. Melt the butter in between. Add smoked ham and rosemary in the melted butter and mix it with the bread dices. Spread the mix on the potatoes and put them back in the oven. Bake them until the bread dices are finely brown and potatoes are cooked.

After our successfully conducted experiment, we evaluated the results internally and decided to carry out the same experiment with other participants. We sent an invitation e-mail to all members of the TUM: Junge Akademie and also to some of the student associations and faculties. The event was analyzed and evaluated by a questionnaire. The results of the evaluation are discussed below intensively.

### 3. Outcome and discussion

A questionnaire has been designed for the assessment. The form is divided into three categories:

1. Personal questions
2. Nutrition habits
3. Evaluation of the Cooking Events

A questionnaire serves to check the hypotheses:

1. Cooking together encourages people to eat healthier.
2. Cooking together safes food resources.

Asking the participants questions about their nutritional habits helps us to understand the participant's daily nutrition and to see if the event changed anything concerning their eating behaviors. As we send the event's invitation through the Academy we had to find another way to collect the answers of our participants in order to keep their answers anonymously. Hence we created an evasys-account sending all participants an e-mail with the online interview right after the second event. Nine forms were completed, which represents a participation of 81.82%.

Of course, a random sample of nine participants is not enough to make a statistically meaningful statement about the tendencies of the population as a whole. Therefore, we used the data only to specify and improve the questionnaire for further events. The questionnaire thus serves as a baseline study.

A total of seven women and four men have participated in the event. All participants were aged below 30. We assumed that the youngest participant was at least 18 years old, because all participants were students. (Fig. 1)

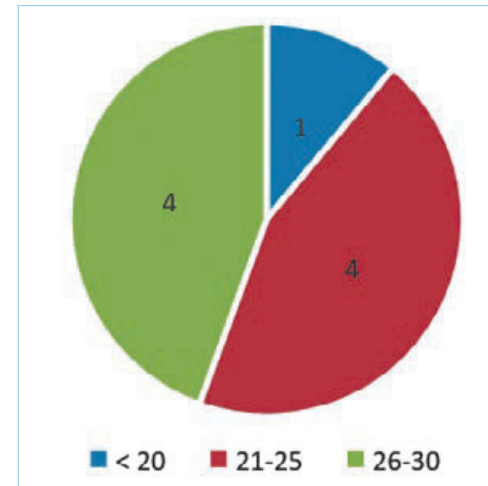


Figure. 1: Age distribution of all participants in the social-cooking-event

There were students from six different study programs (Fig. 2).

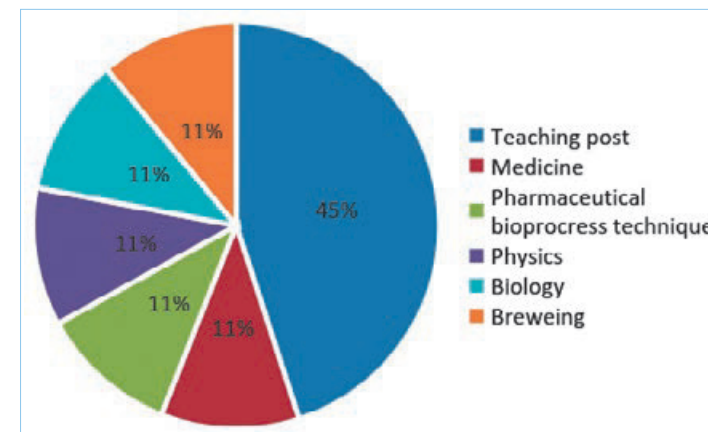


Figure. 2: Distribution in study programs of all social-cooking-event participants



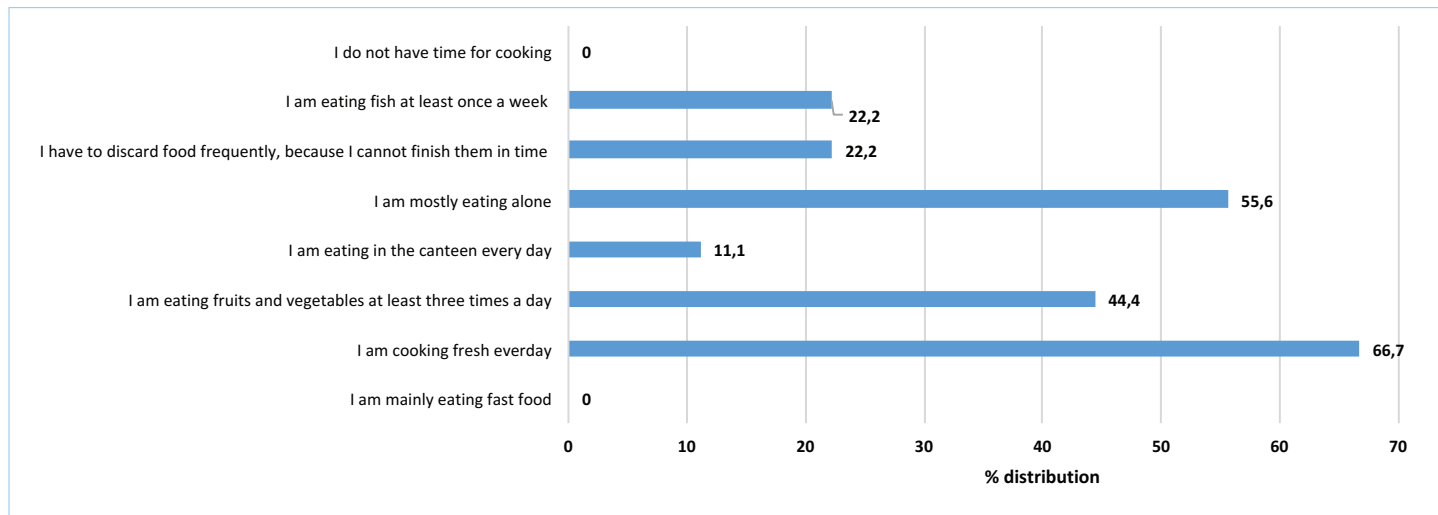


Figure 3: Results of the questionnaire on daily nutritional behavior

The results on daily nutrition habits show that a majority of participants (66.7%) cook one meal per day, but many of them eat on their own (55.6%). 44 percent of the participants indicate that they eat fruits and vegetables at least three times a day, while just 22 percent of them eat fish once a week. 11.4 percent of the participants eat either at the cafeteria or in the food hall every day, although no one stated that they are out of time to cook fresh. In

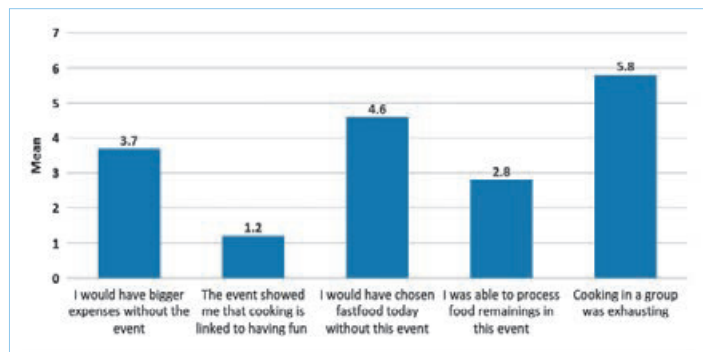


Figure 4: Results of the event questionnaire

addition, none of the participants indicated that they mainly eat fast food. 22 percent of the participants have to discard food because the food is uneatable on regular basis. (Fig. 3)

Within this social-cooking-experiment, four participants spent less money than they would have spent on a regular dinner. At the same time many claimed that more leftovers and “remnants” were turned into something useful through the cooking event. Therefore, the hypothesis that “cooking together saves food resources” cannot be discarded. Of course, there is a need of further evaluation to confirm this hypothesis. All participants agreed on the fact that they had a lot of fun while cooking together whilst no one found it tiring. (Fig. 4)

The hypothesis that “Cooking together encourages people to eat healthier” can be verified not only by the questionnaire but also by the recipes that we received from the participants. Six participants mention in their forms that they would never choose fast food over a cooking event. In addition, none of the participants indicated that they would have eaten fast food if it wasn’t for the cooking event. The evaluation also showed that the participants’ food habits were already healthy before the cooking events.

#### 4. Summary and future goals

The evaluation of our event showed that eating together is fun for all participants and can contribute to the saving of food resources. However, we could not prove that participants in a community eat healthier together than alone. The actual organization of further events will now be our highest priority. We also realized that we need to focus on improving our advertising skills in order to make events like this happen more frequently in the future.

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# Project Report **Foodtrust**

## Team

Paul Bandow  
Fabienne Haas  
Florian Männer  
Jan Mathony  
Philipp Rinner  
Tobias Wörl

## Tutor

Maximilian Biebl  
Carolin Thiem

## Mentor

Prof. Dr. Alwine Mohnen  
Prof. Dr. phil. Ruth Müller  
Dr. Hannes Petermeier  
Prof. Dr. (em.) Peter Wilderer

“Is ham also considered meat?” The man who asked me this might be well into his forties. He has a strong Bavarian accent, which is not surprising because we are in the centre of Freising, a small city twenty miles north of Munich. We are doing a survey on nutrition and randomly asking people to fill out two pages containing questions about food. The man was asked: “On how many days of the week do you eat meat?” With this and other questions, we wanted to find out what concerns people the most when it comes to groceries. The initial idea was to investigate the food industry and how management and certification ensure the quality of food products. Instead of asking the experts first, we were interested in what consumers know about these procedures and how they feel about them.

Initially, our project was aimed at a totally different goal. We wanted to travel to Kenya, to tackle the problem of food security in developing countries. But we found out soon enough that this was actually a lot harder than we thought. After weeks of research and talking to people who have been working on this particular problem, we were crushed by the magnitude of factors involved. We could not find a precise topic which we could use to develop a project. For instance, we found that The Farming Handbook of Kenya provides all the information one needs to grow profitable crops on virtually any site in Kenya. It was published years ago, but nobody seems to be using it – why? This, and similar dead ends, led us to the decision to reorient the project.

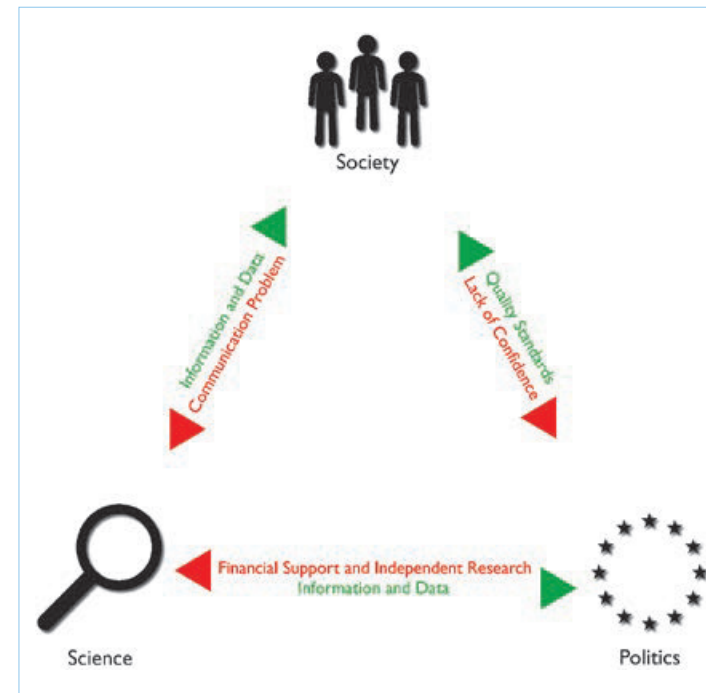


With our new project we achieved a great response in Freising. We had some vivid discussions with passers-by and we noted that there are lots of different opinions among the people. Most of them seem to rely more on “gut feeling” than on actual facts. The people were very interested in what we were doing and asked us about our project.

However, the results of the survey were inconclusive. Probably, our questions were not precise enough and we took previous knowledge for granted. With a second survey we wanted to dig a little deeper and to focus on what people actually know about food production and the origin of the food products they buy. We wanted to know whether they trust science and the policies involved with food safety and hygiene and if they believe that national and international law-making is in their best interests. We also revised our questions. For example, instead of just asking if people care about the ingredients of a product, we asked if they actually read the ingredients list which is printed on the packaging. This gave us more detailed information on how consumers actually behave when they are shopping for groceries.

Furthermore, we felt the need not only to portray the view of consumers but also of people dealing professionally with understanding and regulating the food sector. Therefore, we conducted a few interviews with scientists at TUM, politicians, and Bavarian government officials about their roles in food legislation. We asked them about their work and what they feel is necessary to ensure the provision of healthy and tasty food in our country.

Currently, we are working on a way to introduce a new method of placing consumers, scientists and decision-makers in dialogue with one another. We wish to increase transparency and the flow of information within this triangle of key players. Consumers have to demand what they want, scientist have to find out and communicate what we actually need, and politicians will have to listen carefully and decide how this can be translated into law. Our whole society could benefit from this simple exchange and in the end we can all enjoy a wonderful meal. And by the way, after all this research, we are pretty sure that the answer to the initial question is: “Yes, ham is also considered meat.”



Interactions between society, science and politics



## Abstract

To address the issue of food security we sought to evaluate the knowledge of consumers about production processes and to find out about their food-buying habits and their opinions on food policies and quality control. For these purposes, we distributed two consecutive surveys to students and passers-by in Freising and via the internet. Among other findings, we discovered that people wish for more transparency in decision making. In the future, we intend to explore new models of communication that will facilitate dialogue among scientists, politicians and consumers and that will help to ensure a satisfactory level of food security.

## Background

In order to tackle the problem of food security, we felt the necessity to expand the reach of the project across our borders. In Europe, provision of food and water is basically secure but in other parts of the world 795 million people suffer from malnutrition. In Sub-Saharan Africa one person in four is undernourished.<sup>1</sup>

We wanted to take advantage of the fact that TUM is operating a research facility in Malindi, Kenya, to make a small contribution to the global effort to reduce world hunger.

During our extensive research we were not able to identify a single problem for which we could find a simple solution that could be developed into a project. We discovered that the current situation in Kenya is the product of processes that have been going on for many years and of complex factors that cannot be easily disentangled. We felt unequipped to match the work of people who have dedicated their life to the fight against hunger. Therefore, we cancelled our plan to travel to Kenya.

However, we were still intrigued by the idea of talking to ordinary people and hearing how they feel about their situation concerning nutrition and food in general. So we decided that we might as well do it here in our own environment. We observed that in our soci-

ety there is a cultural shift going on in the attitude of the people towards food. “You are what you eat” is no longer just a proverb.

In Germany, the sales of organic products were over eight billion euros in 2014, which is an increase of 11 percent from the year before.<sup>2</sup> Approximately 7–10 percent of the people in Germany claim to be vegetarians (numbers from 2015). This represents nearly a tenfold increase since 1983.<sup>3</sup> We wonder if this is a product of increasing wealth in society?

Is it because of the recent food scandals that have focused a lot of media attention on how food is produced nowadays, particularly in connection with the production of meat?

After gathering so much data on Kenya and talking to experts in the field, we felt compelled to do our own research on the attitudes of consumers towards nutrition, buying habits and food safety. Therefore, we chose to do a survey among students and in the town-center of Freising. While this first attempt was rather a general evaluation of the status quo, we developed a second questionnaire which would go into more detail.

## Goals and methods

The main objective of this study was to investigate the processes in science and politics which are intended to ensure a reasonable and reliable monitoring of the quality of food. We especially focused on the consumer's view of quality management in the food sector. Therefore, we did two surveys.

With the first survey, we wanted to investigate general consumer behavior in relation to the purchase and consumption of food and the levels of basic trust that people have in food security. Furthermore, we wanted to know to what extent the consumers trust the institutions that make laws in the food sector (the government/politicians) and the institutions that monitor or regulate the laws (food science/scientists and the food inspectorate/inspectors).

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<sup>1</sup> <https://www.wfp.org/hunger/stats> (viewed on September 21st 2016)

<sup>2</sup> <https://www.foodwatch.org/de/informieren/bio-lebensmittel/mehr-zum-thema/zahlen-daten-fakten/> (viewed on September 21st 2016)

<sup>3</sup> <https://vebu.de/vegie-fakten/entwicklung-in-zahlen/anzahl-veganer-und-vegetarier-in-deutschland/> (viewed on September 21st 2016)

With the second survey we focused on what people actually know about food production and the origin of food products. Moreover, we wanted to find out the most important decision criterion for consumers when buying food. We especially focused on the general scientific interest of the people and the impact of scientific findings in the food sector for buying decisions. Furthermore, we wanted to find out people's opinions on the current food laws in Germany and on the ways in which scientific findings are translated into legislation.

Both surveys were created, conducted and analyzed online with the evaluation software EvaSys (Electric Paper Evaluationssysteme GmbH, Lüneburg, Germany) and Microsoft Excel (Microsoft Corporation, Redmond, USA). For the first survey, we also interviewed people in the inner city of Freising and students of the TUM School of Life Sciences Weihenstephan. The sample size was 323 in the first survey and 41 in the second survey. The median age of the participants was 24.86 years in the first survey and 23.17 years in the second survey. The vast majority of respondents were students.

## Results

The results from the first survey were, in part, quite surprising. One important result was that the participants oriented their buying decisions mostly according to the price of the products, which was not surprising as we interviewed mostly students. On the question of the sources of food, this was important for the students, but even more important for the people we interviewed in Freising. Quality seals, however, were not of high importance either for the students, or for the passers-by.

Furthermore, we found that the people trust food security in Germany and think that they can consume food without any health risks. But this trust does not seem to be well-informed, as respondents appeared to know little about the processes of food production and even less about the backgrounds of regulations in the food sector. Therefore, such trust would appear to result, rather, from the lack of negative experiences.

In order to differentiate the trustworthiness of different quality seals, we asked the people to rate ten different seals. It was especially noteworthy that seals of regional quality (like the "Staatliches

Biosiegel" or "Geprüfte Qualität – Bayern") and the Fairtrade seal received better ratings compared to EU and world-wide seals.

Finally, we asked people to indicate the importance for them of transparency in nine different fields. Food hygiene was ranked in top position, drinkable water in second and food security in general in third.

Another important and not less interesting finding on the matter of food security was that most people trust the executive that deals with complaints more than the political legislative authorities.

The results from the second survey confirmed some of the previous findings. Most of the respondents stated that they are interested in the source of their food and they inform themselves about it. On the other hand, they do not read up about the sources of the ingredients contained in their food.

Most likely due to the importance of the source of their products, people give more weight to the quality of a product than to the price. However, lower quality is accepted when it is less convenient to acquire a high quality, more expensive product. But still, one half of the participants would choose the high quality product.

According to our research, the respondents are sure that enough research into questions of food security is carried out but the results are too difficult for most of them to understand so they cannot use them as the basis for their buying decisions.

Finally, we were able to confirm another result of our first survey for, once again, people criticized the lack of transparency, especially within decision making processes.

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TUM: Junge Akademie	Umfrage Lebensmittelsicherheit	

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 Korrektur: ☐ ☒ ☒ ☐ Bitte beachten Sie im Interesse einer optimalen Datenerfassung die links gegebenen Hinweise beim Ausfüllen.

### 1. Verhalten/ Routinen/ Kauf und Verzehr von Lebensmitteln

1.1 An wie vielen Tagen pro Woche essen Sie Fleisch? ☐ 0 ☐ 1-2 ☐ 3-4  
☐ 5-6 ☐ 7

1.2 An wie vielen Tagen pro Woche essen Sie Fertiggerichte/ Fastfood (z.B. Tiefkühlpizza, Burger, Pommes, etc.)? ☐ 0 ☐ 1-2 ☐ 3-4  
☐ 5-6 ☐ 7

1.3 An wie vielen Tagen pro Woche verzehren Sie frisch zuhause zubereitete Mahlzeiten? ☐ 0 ☐ 1-2 ☐ 3-4  
☐ 5-6 ☐ 7

1.4 Worauf achten Sie beim Kauf von Lebensmitteln hauptsächlich? (Mehrfachauswahl)  
☐ Preis ☐ Herkunft ☐ Inhaltsstoffe  
☐ Lebensmittelsiegel ☐ Optik

1.5 Hier können Sie weitere Punkte angeben, die unter 1.4. nicht aufgeführt wurden.

### 2. Lebensmittelqualität/ Standards

2.1 Denken Sie, dass in Deutschland verkaufte Lebensmittel im Allgemeinen gesundheitlich unbedenklich sind? Ja, vollkommen ☐ ☐ ☐ ☐ Nein, keines falls ☐  
 Denken Sie, dass Lebensmittel in Deutschland unter höheren Qualitätsstandards hergestellt werden, als...  
 2.2 ...in anderen europäischen Staaten? ☐ Ja ☐ Nein  
 2.3 ...in nordamerikanischen Staaten? ☐ Ja ☐ Nein

2.4 Wie gut würden Sie Ihr Wissen über den Prozess der Lebensmittelerzeugung einschätzen? Gut ☐ ☐ ☐ ☐ Schlecht

2.5 Wie schätzen Sie die Überwachung der Lebensmittelerzeugung in Deutschland ein? Gut ☐ ☐ ☐ ☐ Schlecht

2.6 Wie beurteilen Sie die Transparenz bei der Erstellung von Lebensmittelvorschriften in Deutschland? Gut ☐ ☐ ☐ ☐ Schlecht ☐ Kann ich nicht beurteilen

2.7 Falls Sie "Kann ich nicht beurteilen" angekreuzt haben, begründen Sie bitte Ihre Wahl (Mehrfachauswahl)  
☐ Fehlende Verfügbarkeit von Informationen ☐ Zu komplex ☐ Fehlendes Interesse

2.8 Wie sehr vertrauen Sie der Arbeit von Gutachtern und Sachverständigen im Lebensmittelbereich in Deutschland? ☐ ☐ ☐ ☐ Überhaupt nicht

2.9 Denken Sie, dass Gutachten unabhängig von Geldgebern und Interessenverbänden erstellt werden? Vollkommen ☐ ☐ ☐ ☐ Überhaupt nicht

F7288U1442P1PL0V0 13.06.2016, Seite 1/2

Questionary of the first survey

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### 2. Lebensmittelqualität/ Standards [Fortsetzung]

Wie hoch beurteilen Sie die Vertrauenswürdigkeit folgender Lebensmittelsiegel?

2.10 Staatliches Biosiegel Hoch ☐ ☐ ☐ ☐ Niedrig ☐ Kenne ich nicht

2.11 Biosiegel der EU ☐ ☐ ☐ ☐

2.12 FAIRTRADE ☐ ☐ ☐ ☐

2.13 FSC - Forest Stewardship Council ☐ ☐ ☐ ☐

2.14 EU-Herkunftszeichen ☐ ☐ ☐ ☐

2.15 Geprüfte Qualität - Bayern ☐ ☐ ☐ ☐

2.16 MSC - Marine Stewardship Council ☐ ☐ ☐ ☐

2.17 Pro Planet ☐ ☐ ☐ ☐

2.18 Qualitätssiegel der deutschen Landwirtschaft ☐ ☐ ☐ ☐

2.19 Rainforest Alliance Certified ☐ ☐ ☐ ☐

In welchem der Bereiche erachten Sie die Transparenz der Qualitätssicherung und hochwertige Gutachten für besonders wichtig?

2.20 Lebensmittelsicherheit Sehr wichtig ☐ ☐ ☐ ☐ Unwichtig

2.21 Lebensmittelhygiene ☐ ☐ ☐ ☐

2.22 Lebensmittelverpackung ☐ ☐ ☐ ☐

2.23 Lebensmittelkennzeichnung ☐ ☐ ☐ ☐

2.24 Futtermittel ☐ ☐ ☐ ☐

2.25 Trinkwasser ☐ ☐ ☐ ☐

2.26 Nahrungsergänzungsmittel ☐ ☐ ☐ ☐

2.27 Tierhaltung ☐ ☐ ☐ ☐

2.28 Tierschutzanforderungen ☐ ☐ ☐ ☐

### 3. Demografische Daten

3.1 Alter

3.2 Geschlecht ☐ Weiblich ☐ Männlich

3.3 Welche Erwerbsituation trifft am besten auf Sie zu? ☐ Vollzeit-erwerbstätig ☐ Teilzeiterwerbstätig ☐ Geringfügig erwerbstätig  
☐ In einer beruflichen Ausbildung ☐ Nicht erwerbstätig

3.4 Wenn Sie nicht vollzeit- oder teilzeiterwerbstätig (bzw. in einer beruflichen Ausbildung) sind: Präzisieren Sie bitte, zu welcher Gruppe aus der Liste Sie gehören ☐ Schüler/-in an einer allgemeinbildenden Schule ☐ Student/-in ☐ Rentner/-in  
☐ Arbeitslose ☐ Dauerhaft Erwerbsunfähige

Vielen Dank für Ihre Teilnahme und Ihre Unterstützung

F7288U1442P2PL0V0 13.06.2016, Seite 2/2



## Summary and future directions

The results of the last survey show the opinions and views of society on questions of food security in scientific research and political decision-making. Most of the people trust the food inspectorate more than the politicians making regulations. In their eyes, scientists are doing enough research on food security. The consumers in general inform themselves about ingredients and the place of manufacture but they usually do not know anything about the origins of the raw materials or ingredients.

From the results of the surveys, we created a triangulation model for describing the interrelations between science, politics and society as far as food security is concerned. The views of science and politics are necessary to complete this model and therefore interviews with scientists and politicians seem to be essential. Scientists might be asked if they believe enough research has been done into questions of food security and at what levels of independence it was carried out. It might also be interesting to enquire into what scientists think about the relationship of society and science in food security.

We have scheduled interviews with scientists at the TUM research campus Weihenstephan in Freising and the LGL (Bayerisches Landesamt für Gesundheit und Lebensmittelsicherheit). Within the political sector we plan to speak with people at the ministry of consumer protection or the ministry of agriculture.

After analysing the data from surveys and interviews, a realistic triangulation model of relationship between science, politics and society can be set up to properly address the question of food security. We hypothesize that there may be large discrepancies in views of food security among these three parties, as has already been suggested by our earlier surveys. In anticipation of this problem, our team is working on a new format for discussion that can bring together the three parties of “science,” “politics” and “society.”

The final aim of the project is to analyze the relationships between these parties in more detail and to use this analysis to promote improved communications and clearer information on food security so that consumers have a solid basis for trusting the legislative and executive food authorities.







# Project Report #quasivegan

Team	Florian Andres Fabian Finger Maximilian Held Maximilian Juna Simon Rieß Hanna Scheuermann
Tutor	Maximilian Biebl Carolin Thiem
Mentor	Prof. Dr. Alwine Mohnen Prof. Dr. phil. Ruth Müller Dr. Hannes Petermeier Prof. Dr. (em.) Peter Wilderer



“What? You have stopped eating meat! Why? Do you want to live healthier?” Almost all of my friends reacted like that when they heard that I had stopped eating meat. “Are you crazy?” was also a frequent comment. But the crazy thing is, they all got the reason at once. This suggests that everyone knows that living a vegetarian lifestyle might be the better alternative. So why do only a few people adopt such a lifestyle?

Almost eighteen months ago I started at the TUM: Junge Akademie. At the kick-off weekend, around twenty young students, including me, agreed to launch a project with the topic “nutrition”. Everyone came up with great ideas – but that was the problem! Finding a project all of us were happy with was more than challenging and the result was a break-up of the group into three smaller but still linked project groups.

I grew up in a classic middle-class family. It was and still is normal for my parents to eat meat every day and so did I. Starting my student life, I moved out. It’s not surprising that I cooked and ate as I had learned to do at home – meat almost every day. I knew, as well as my mentioned friends, that eating less meat would be good for me. Retrospectively, I can see I was just being lazy – too lazy to change my lifestyle. Many times since I moved out, I tried to diminish my meat consumption. The outcome was always the same: I reverted to old patterns, because it was easier to cook food I was familiar with and because of a lack of alluring alternatives. During the discussions in our project, I discovered that many other students evince the same behavior. To tackle this issue we decided to publish a brochure with vegetarian and vegan recipes. This will be distributed to first-semester students in order to help to reduce the consumption of meat and animal products. To counter some people’s concerns that they cannot get all essential nutrients, we post some of the micro- and macro-nutrients for each recipe. These are based on research as well as the insight that nutrition based on reduced consumption of animal products<sup>1</sup> is healthier.

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<sup>1</sup> Compared to the normal German citizen

In my case, only a radical solution was effective: I renounced meat completely. Therefore, I was forced to have my eating behavior always on my mind. Now I have a broader repertoire of meals I can cook easily and eating vegetarian does not mean any more expense for me. This hard work – changing lifestyle – can be facilitated with our new cooking brochure.

At the beginning of my vegetarian phase, I promised myself not to eat tofu. I somehow had, and still have, a prejudice against meat-replacement products. Anyway, after twenty-four days of “abstinence”, my flat-mate gushed over spaghetti bolognese and my promise was broken. I never thought tofu bolognese would taste so delicious. That led us to the second reason why many people eat so much meat: It is tasty, at least for many. Nevertheless, we want to persuade people, and especially students, to eat less meat and animal products and to give them free support with our brochure.

We named our group QuasiVegan. This name is intended to suggest that it is not the strict vegan or vegetarian lifestyle of a few that will change the world, but the small steps of the large mass of people. If every German citizen skipped one meal with chicken, approximately  $(81,000,000 \cdot 0.2\text{kg}) / (1.8\text{kg} \cdot 2/3)$  13,000,000 animals would be saved. Eating meat and animal products now and then is still OK and so all of us can be QuasiVegan.

There are also ethical arguments for not eating meat, but it was not the aim of our project to focus on these (though for those interested in this subject, I would recommend the book *Eating Animals* by Jonathan Safran Foer).

Finally, I can only hope that you try our recipes and enjoy them – and that you are inspired by our ideas. I can at least assure you that one person has already been sustainably changed: me!





**This meal is:**

*vegan*



**I need:**

*nothing special*



**Preparation time:**

*30 minutes*



**Food value:**

*Copper 61 % RDA, Manganese 75 % RDA, Folic acid 50 % RDA*

# Penne pasta on spinach-peanut-sauce

## For two persons:

1 onion  
1 garlic clove  
20 g ginger  
200 g penne pasta  
salt  
1 EL oil  
125 g frozen leaf spinach  
(defrosted)  
100 ml unsweetened  
coconut milk  
50 ml vegetable broth  
2 EL peanut butter  
1 TL sambal oelek  
2 EL lime juice  
2 EL peanuts  
(roasted and salted)

## Preparation:

1. Peel onion and slice into small pieces, squeeze garlic clove. Slice ginger into small pieces. Cook the pasta in boiling salt water.
2. Heat 1 EL oil in a pan and steam onion, garlic and ginger 2 minutes in the oil. Squash the spinach, add it to the pan and steam it for a moment with the other ingredients
3. Add the coconut milk and boil everything up. Add the peanut butter and boil at low heat for five minutes. If necessary, add up to 50 ml vegetable broth. Flavour with salt, sambal oelek and lime juice. Drain off the pasta and mix with the spinach-peanut-sauce. Chop the peanuts and sprinkle over the pasta.

## Abstract

#QuasiVegan offers information about a partially vegetarian and vegan diet, refutes the prejudice of exotic and expensive ingredients and provides specific recipes for a balanced and healthy diet in the form of a brochure.

## Background

### Micronutrients

#### Overview

Nutrients form the foundation of our lives. Besides the macronutrients, our body needs 33 micronutrients as the word implies in doses of micrograms. Amongst these there are 14 trace elements, 13 vitamins and 6 minerals. These substances are indispensable for our body and enable all vital functions of our organs (Jopp 2010).

“Micronutrients are able to advance as far as to the cell nucleus, where they have direct impact on the scanning of our gene sequences. In this way they activate and modulate our immune system. Thus a deficiency of these biocatalysts makes direct impact on metabolism and immune system.” (translated from Jopp 2010, p.13).

The Max Rubner-Institute gives an overview of the most important micronutrients (Max Rubner Institut 2008):

- |                              |   |
|------------------------------|---|
| Vitamins:                    | <ul style="list-style-type: none"><li>• vitamin A, C, D, E</li><li>• vitamin B1, B2, B6, B12</li><li>• niacin</li><li>• folacin</li></ul>                         |
| Minerals and trace elements: | <ul style="list-style-type: none"><li>• sodium</li><li>• potassium</li><li>• calcium</li><li>• magnesium</li><li>• iron</li><li>• iodine</li><li>• zinc</li></ul> |

## Deficient supply

There are various deficiency symptoms, indicating the body suffering from malnutrition. Jopp describes six stages of the consequences of a shortage in micronutrient supply (Jopp 2010):

- stadium 1 and 2: depletion of histoid and osseous reservoir
- stadium 3 and 4: deficiency symptoms: lowered metabolism and accumulation of damages
- stadium 5: malfunction symptoms requiring treatment
- stadium 6: pathological malfunctions: irreversible damages

Deficient supply of micronutrients begins at toddler age and is a worldwide problem (Hilger 2015). Numerous studies prove this fact.

Kennedy et al. describe, for instance, the essential significance of all the 8 B vitamins for the brain functions. Higher doses than the recommended ones are reasonable. (Kennedy 2016). Jopp concurs and names numbers for potential “overdose” from one and a half the dose of folacin up to 166-times of vitamin B12 in comparison to the recommendations of the German Nutrition Society. He says that the RDA (recommended daily allowance) is only the bottommost limit which shouldn’t be reduced under any circumstances (Jopp 2010).

Migliozzi et al. adduce reasons for higher risks of diabetes, obesity, cancer and cardiac diseases due to deficient supply of micronutrients (Migliozzi 2015).

Especially for the increasing part of the world population living in megacities, the problem of “particulate matters” in polluted air plays an important role in human health, because they are respirable. Peter et al. state that a sufficient supply of micronutrients has a big chance of responding to this problem without drug-treatment. B vitamins as well as vitamin C, D and E lower the risk for pulmonary and cardiovascular diseases (Peter 2015).

## Where to get those micronutrients?

The extent to which foods contain those life-sustaining micronutrients cannot be answered easily. Storage duration or methods of preparation play an important role.

There is an abundance of scholarly literature about this topic (see, for example, Dunkelberg et al. 2012). For a quick and convenient guide to what micronutrients your meal includes, we recommend an online search for “tracking nutrition”.

### Reducing meat consumption

In 2008, 1.6 % of the German population lived as vegetarians and numbers are steadily increasing. Whereas in the past, nutritionists primarily focused on nutrition deficiency going along with vegetarianism, today's discussion has shifted towards the preventive potential of a nutrition with reduced meat consumption (Ströhle 2006).

The German nutrition society (DGE) stated, in conformity to recent research results, ten rules for a healthy and balanced diet. One of the most important of these rules warns against an excessive consumption of meat, sausage products and eggs. According to the DGE, an amount of 300 to 600 g meat per week should not be exceeded. This includes a maximum of three portions (150 g) of meat and three portions (30 g) of sausage per week. Another of the ten rules calls for a reduction of fat and fat-laden food. A high uptake of fat may cause overweight due to the considerable energy content of fat. Disorders of the fat metabolism can often be traced back to the undue consumption of saturated fatty acids and may lead to cardiovascular disease. According to the DGE, 60 to 80 g fat per day should not be exceeded. It is recommended to buy special low-fat meat and sausage sorts. Additionally, fat-reduced ways of preparation like steaming should be preferred.

Although meat contains valuable mineral substances like iron and zinc, as well as B vitamins like B6, B12 and niacin, it also contains health-damaging substances like fat, cholesterol and purines. The latter increase the risk of contracting gout (DGE 2016a). There is scientific evidence that an exceeding consumption of red meat raises the risk of colorectal cancer and deadly cardiovascular diseases (DGE 2016b). A vegetarian diet minimizes these risks.

Every vital substance contained in meat products can also be ingested by eating non-meat products (Ströhle 2006). Vitamin B6 for example can be found in fish, vegetables and wholegrain products, as well as niacin in fish and wholegrain products. Iron can be found in spinach, peas and legumes (DGE 2016c).

The “Nationale Verzehrsstudie II” (national eating survey II) from 2008 is the most comprehensive survey on eating habits and food consumption in Germany. Its results reveal that men consume approximately twice as much meat and sausage products as women. On average, men consume 103 g meat per day, which exceeds the recommended value of 300-600 g per week considerably. Both men and women at every age exceed the recommended fat consumption amount according to DGE (Max Rubner Institut 2008). The DGE's recommendations suggest a percentage of 30 % of an adult's overall energy consumption to be ingested as fat. Furthermore, both men and women at all ages exceeded the recommended amount of protein consumption. A reduction of meat consumption could decrease those noticeably high values. This would diminish the risk of disease.

It is scientifically proved that people with a meatless diet suffer less frequently from overweight and high blood pressure, have better blood cholesterol values and consume less saturated fatty acids. Another important aspect of meatless (but balanced) nutrition is the substitution of meat with groceries containing healthy nutritional components like complex carbohydrates, roughage and secondary plant substances. Healthier nutrition, reduces the risk of contracting nutrition-related diseases like heart attacks, strokes, diabetes mellitus and cancer. The consequence is an increasing life expectancy (Leitzmann 2001).

### Goals and methods

There are several main goals which form the objectives of our project. The most important goal was changing the perception of a quasi-vegan diet and removing the almost religious undertone attached to it. We are focussing our efforts on addressing TUM freshers with support for an easy transition into all day university life and getting a feel for a healthy diet. For these young students we want to provide an easy access to a balanced and meat-reduced diet.

Many prejudices come along with the vegan diet. It is supposed to be very expensive and difficult to maintain without suffering from various deficiencies. Our objective was to refute these prejudices by showing that vegetarian and vegan recipes are simple, cheap and healthy.

Overall, we intended to lower people's resistance to trying vegetarian and vegan recipes. This way we wanted to support our freshers in the cooking of their own balanced meals and to make a



transition to an overall healthy lifestyle while beginning this new chapter at university.

We had a clear idea in mind of how we did not want to present our content and what goal we did not want to pursue. Our goal was not to turn our target audience into vegetarians overnight, nor did we intend to include the various ethical aspects that are often linked to this subject. We wanted to avoid a preaching, pseudo-religious approach and to focus on health and lifestyle advantages. Our main objective was giving incentives for reducing the consumption of meat and other animal products as part of a healthy lifestyle. Vegetarians and vegans have a variety of healthy dietary habits, which we wanted to condense and present to our TUM freshers. Reducing animal products is part of the task, but this measure alone won't turn a diet rich in prepared meals and other junk food into a healthy one.

In summary we wanted to motivate young students to take better care of their nutrition and maintain a balanced diet during the crucial period of entering university and organising housekeeping in a new city for the first time.

To reach out to the TUM freshers we decided to conceptualise and design a brochure, which was added to the package they receive on their very first day at TUM. This brochure includes 20 tasty and balanced vegetarian and vegan recipes. These meals are easy to cook with cheap basic ingredients which can be found at any regular supermarket. Furthermore, it includes some guidelines and tips on how to acquire the same habits that make vegetarians healthier than their meat-eating peers, without forcing a lifestyle decision on them.

We conducted an interview with Professor Daniel, head of the chair for nutritional physiology at the TUM School of Life Sciences. She stated that besides possible deficiencies in vitamin B12 or iron, which can be easily avoided with the necessary awareness, a vegetarian or vegan diet is perfectly healthy. However, the lack of comprehensive studies, with a sufficient number of participants over a long observation period, makes it difficult to make definitive and well-documented statements. Various sources indicate the health-promoting properties of vegan and especially well-examined vegetarian diets and a number of other healthy habits like avoiding alcohol and cigarettes, as well as taking regular exercise,

are more likely to be found among vegans and vegetarians – but otherwise it is difficult to make categorical statements. In conclusion, Professor Daniel disclosed her favourite vegan recipe: go to the supermarket, buy all the vegetables you like, get a wok and a sharp knife, fry everything with a little oil, use spices and a bit of coconut oil and serve with rice. These results are also part of the brochure.

In order to evaluate the impact our efforts had, we conducted a survey amongst current young students at TUM, asking them for their opinions on vegetarian and vegan diets. After the start of the new semester, we will conduct a second survey to compare differences in the perception of these types of diets and health-related lifestyle choices.

## Outcome and discussion

The outcome of our scientific research including the detailed reflection about the consequences of a partially vegetarian and vegan nutrition, including the survey and the interview with an expert is a brochure, which intends to give some insights from the scientific point of view regarding vegetarianism or veganism. This brochure contains the mentioned research outcomes and provides 20 recipes which are low in costs, easy to cook and healthier than the average student meal. Each recipe contains specifications about high dosages of certain micronutrients in the respective meal. For better understanding we add an exemplary recipe at this point.

## Summary and future goals

The summary for this project is split into two parts, one presenting the result of the project itself and one reflecting on our personal development while carrying out the project.

Our overall goal was to give positive incentives for change in a difficult and emotion-ridden sphere of life. We intended to sensitise TUM freshers for an important, but often overlooked matter. Normally nutrition is not a topic young students, especially at technical universities, are particularly keen on thinking about. At the time of writing this report we cannot give any feedback from students on our brochure, simply because it has not been printed yet. All steps in the project were completed according to plan and at this moment it is the designer's task to bring our content into its final form. On the other hand, we have found partners for the distribution of

the booklets and we attracted wide interest among several student representatives from various departments. We managed to find recipients for the entire circulation of 2500 leaflets.

From a personal standpoint, I can only state that we have learnt a lot! First of all we had an incentive to think about dietary questions intensively, which changed our perception about our very own diets. We had to find a way of negotiating such an emotion-ridden topic and presenting it in an interesting way. The main lessons with regard to project management were about gathering and processing the required information, conducting an interview with an expert, editing information in a legible and comprehensible way,

as well as working with editors and graphic designers in compiling the final booklet.

The main future priority for this project is to evaluate the students' reactions as well as gathering feedback from them. To do so we will repeat our survey with the new freshers and compare the results. Furthermore, we want to keep our contacts with the student council and establish the brochure as a permanent and long-term part of the information package of TUM freshers. After analysing the feedback we will consider changes and increase the number of participating departments in order to distribute an improved version to an even greater number of students.

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