



# Studying Food Science in the Swiss Higher Education Institutions

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# Studying Food Science in the Swiss Higher Education Institutions

Study Program Satisfaction, Job Profile, and Labor Market Outcomes

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# Executive Summary

This report assesses the situation of food science graduates one and five years after graduation by investigating their satisfaction with the study program, their job profiles and the overall labor market outcomes. We shed light on the difference between graduates from different universities by comparing the situation of graduates from ETH Zurich and graduates from universities of applied sciences (UAS). The analyses rely on the Swiss Graduate Survey, which is a survey among graduates from formal programs at universities and universities of applied sciences in Switzerland. We focus on the period from 2008 to 2018.

The results suggest that food science graduates from ETH Zurich and UAS have several aspects in common, while others highlight substantial differences. Starting by considering the sociodemographic characteristics, we find that less than one third of graduates are male at ETH Zurich, while the gender composition is more balanced at UASs. By considering graduates nationality, we observe that Swiss represent the largest group at both UAS and ETH Zurich, with the only exception of the PhD program at ETH Zurich, which is more international oriented. Lastly, we find that both ETH and UAS graduates have similar frequency in prior work experience, but that this experience strongly differs across the two groups. In case of UAS graduates the previous work experience is much more often related to the field of study they choose at university than in case of ETH graduates.

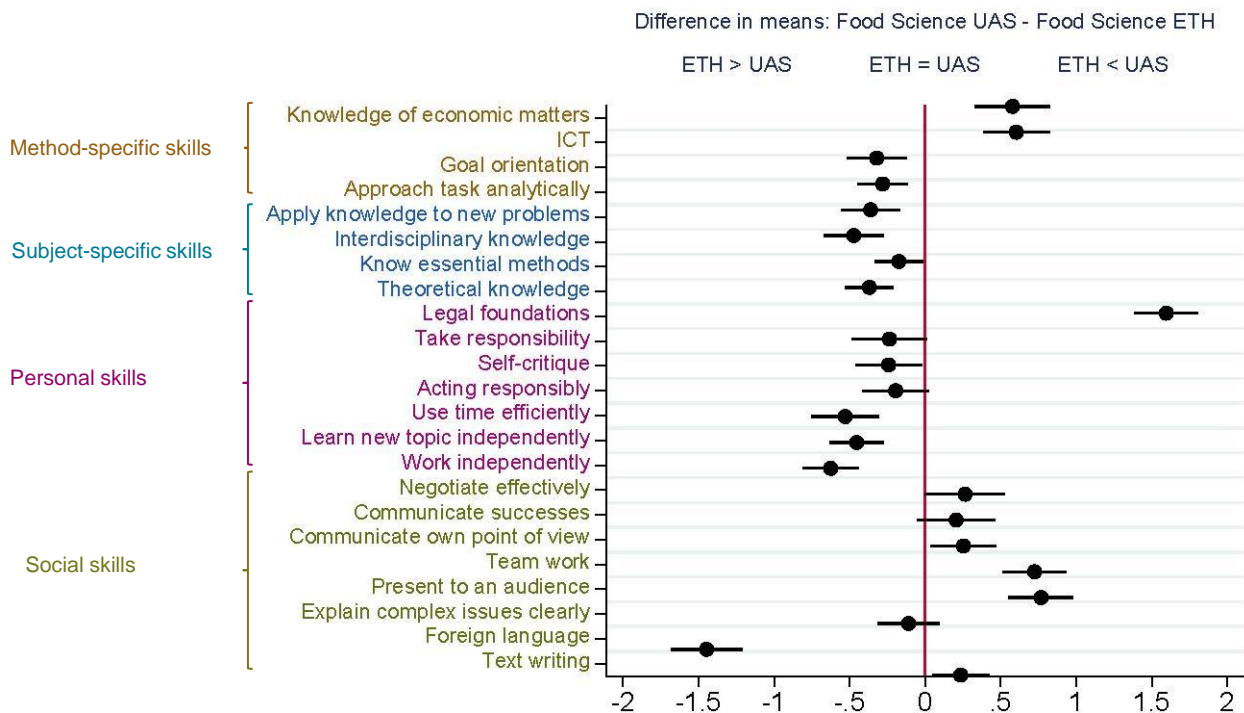
With regard to study program satisfaction, the results suggest that ETH graduates are slightly less satisfied with their food science study program than UAS graduates, but equally satisfied with their current employment and the match of the study program to the employment. UAS graduates are also more likely to be willing to redo the same study program again at their alma mater.

Our results further suggest that ETH and UAS graduates end up having slightly different job profiles. ETH graduates are more likely to work in large (250+) firms, to work abroad, and to have a job for which a tertiary degree was required, but less likely to have a job for which a degree in a specific discipline was required. The last two findings might be possibly related to the occupation that UAS and ETH graduates chose. On the one hand, ETH graduates are more likely to work in an intellectual and scientific profession or as chemists, while UAS graduates are more likely to work as chemical engineers or as managers in the production of goods. Furthermore, also the management position differs across the two groups of graduates. ETH graduates are more likely to work in the lower or upper management, while UAS graduates are more likely to work in the middle management. Finally, it is also remarkable that UAS graduates work disproportionally more often in the manufacturing industry, while ETH graduates are more likely to be employed in the education or in the health & social industries.

This difference in occupation might stem from the difference in the skills acquisition during the studies. Figure ES1 shows that ETH graduates report to acquire more subject-specific and personal skills whereas UAS graduates report slightly more acquisition of social skills. The reporting for method-specific skills is mixed with ETH graduates reporting more acquisition in goal orientation and approach task analytically whereas UAS graduates report more knowledge in economic matters and ICT.

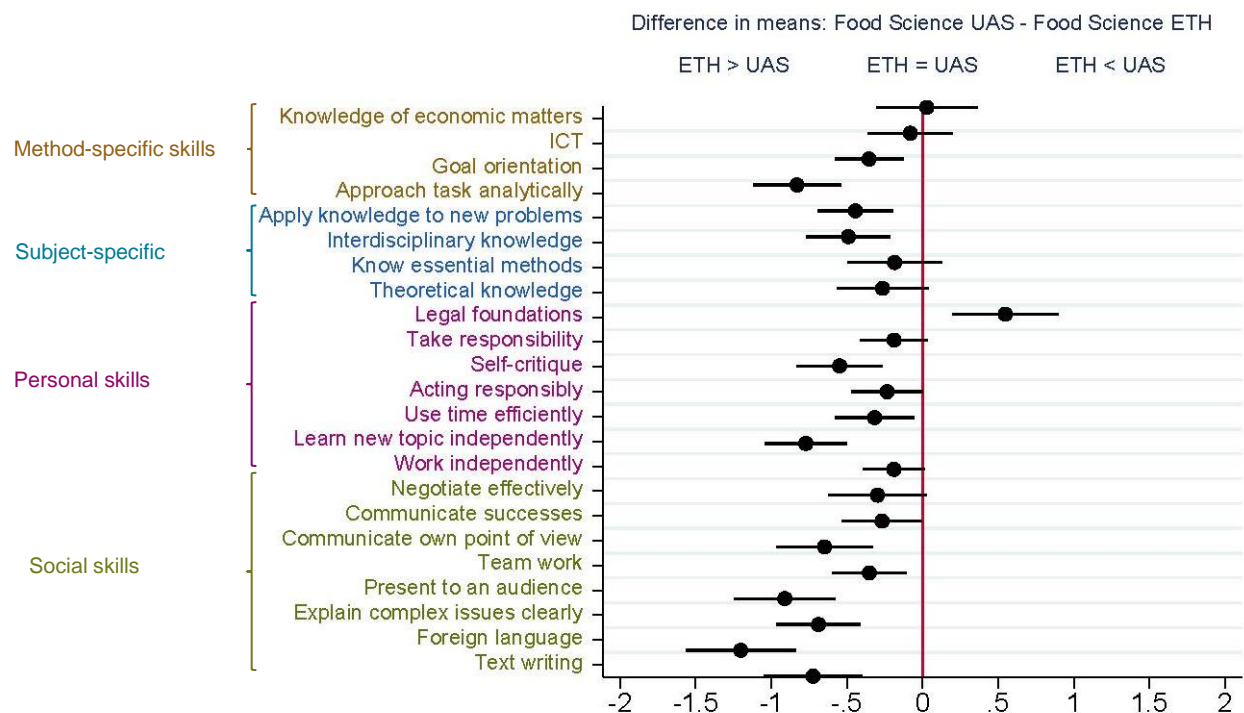
The difference in occupation also reflects in the reported skills graduates use in their current job. As Figure ES2 shows, graduates from ETH Zurich report higher usage of their learnt skills than graduates from UAS for almost all items but legal foundations.

Figure ES1: Difference in the skills acquisition during studies



Notes: This figure reports the difference in mean between UAS and ETH graduates in the skills acquired during studies one year after graduation. Values left from the red lines means that those skills have been acquired more by ETH graduates; right from the line means acquired more required by UAS graduates. The horizontal lines report the 95% confidence interval of the means' difference.

Figure ES2: Difference in the skills usage in current job



Notes: This figure reports the difference in mean between UAS and ETH graduates in the skills required in the current job one year after graduation. Values left from the red lines means that those skills are more used by ETH graduates; right from the line means more used by UAS graduates. The horizontal lines report the 95% confidence interval of the means' difference.

Lastly, concerning the success on the labor market, our results suggest that one year after graduation, ETH graduates are relatively less likely to be unemployed than UAS graduates and more likely to be further in education. However, five years after graduation UAS graduates are more likely to be employed than ETH graduates. Regarding labor income, we do not find any statistically significant difference between UAS and ETH graduates, neither one nor five years after graduation. Lastly, in terms of working conditions, the only difference found was that ETH graduates were relatively more likely to work under a temporary contract, both one and five years after leaving university.

# 1 Introduction

This report aims at providing insights on the food science study program at ETH Zurich, which will undergo a reform in 2022. It is complementary to two studies (“Food Scientists from ETH Zurich” and “Food Science at ETH Zürich – Responses from graduates from 2018 to 2013”<sup>1</sup>) based on surveys about the situation of food science graduates on the labor market and the labor markets view of food science graduates, as it provides additional information besides the outcomes on the labor market.

The specialty of this report is that it not only describes the situation of graduates from the food science program at ETH Zurich but on all graduates from food science programs on tertiary education level. Thereby, we differentiate between graduates from ETH Zurich, from universities of applied sciences and from food science related programs at ETH Zurich. The comparison among institutions is crucial as universities and universities of applied sciences have different aims and curricula.

The content of this report is as follows. We first describe the dataset, then focus on who graduates from the food science program followed by graduates’ satisfaction with the food science program. Then, we analyze the job profile of graduates and their labor market outcome. The data thereby is separated for results one year and five years after graduation and also includes graduates from food science programs at universities of applied sciences and graduates from food science related programs. The graduates from the ETH Zurich food science program are further divided into bachelor graduates, master graduates and doctoral graduates, when data is sufficient. We end the report by highlighting the most interesting findings and suggest areas for further investigation.

<sup>1</sup> These studies were presented internally and are not published for the public.

## 2 Description of Dataset

This report relies on data from the Swiss Graduate Survey, which is the most suited dataset to evaluate the situation of food science graduates with regard to their study program satisfaction and to their labor market outcomes. In this section we first provide some general information of the dataset, and then we describe the sample used for our analyses.

### 2.1 Data Source

The Swiss Graduate Survey is a survey among all graduates of formal programs universities and universities of applied sciences in Switzerland. The survey is conducted by the Swiss Federal Statistical Office every other year. Hence, every other cohort is surveyed. Each cohort is surveyed twice, namely one year and five years after graduation. The survey asks graduates one year and five years after graduation about their study and labor market experience. In particular, besides personal data and current living situation, the survey registers general information on completed study courses, information on the transition from higher education to the labor market, graduates' professional situation one/five years after graduation, the employment history since graduation, the attendance of further education and training, and a self-evaluation of the current professional situation and career.

The response rate for the surveys one year after graduation is on average between 55% and 65%. In this first survey participants are asked whether they would be willing to take part in the second survey four years later. Of those agreeing to take part around 75% actually do, which corresponds to roughly 30% of all graduates.

### 2.2 Sample

#### Sample Restriction

For the analysis of food science programs we focus on the data after the Bologna reform from 2008 to 2018. This time range covers six waves of graduate surveys one year after graduation and four waves of graduate surveys five years after graduation.

The main graduates of interest are those from the food science programs at ETH Zurich. To be able to better estimate the situation of those graduates, we also consider graduates from food science programs at universities of applied sciences (UAS)<sup>2</sup> and an aggregation of graduates from food science related fields at ETH Zurich. The programs that we assume to be related to the food science one are agricultural science, chemical engineering, biology, and pharmaceutical science. We confirmed the program selection with a member from the food science department.

Another restriction which is given from the study behavior of students is that food science graduates from the bachelor program at ETH Zurich – with few exceptions – continue to a master program. Therefore, our analyses for the bachelor program are limited to the experience during the studies. No or not

<sup>2</sup> The data set contains information on food science graduates from the universities of applied sciences in Berne and Zurich. All graduates where from the bachelor level as there was no data on graduates from the master level yet.

enough information is available for the analysis of job profile and labor market outcomes of bachelor programs at the ETH Zurich.

### Sample Size

Applying these choices leaves us with a total of 2,510 observations on graduates taking part in the survey one year after graduation. Table 1 shows in detail the number of graduates of each cohort and the educational program.

*Table 1: Sample size total and over cohorts for graduates one year after graduation*

Cohort	2008	2010	2012	2014	2016	2018		Total
Food Science								
...at UAS (Bachelor)	47	35	46	51	66	59		304
...at ETHZ (Bachelor)	0	29	36	48	40	56		209
...at ETHZ (Master)	6	17	21	35	25	41		145
...at ETHZ (PhD)	7	6	11	14	16	11		65
ETHZ programs								
... Food Science (Total)	13	52	68	97	81	108		419
... Related Programs (aggregation of agricultural science, biology, chemical engineering, pharmaceutical science)	125	288	342	333	351	348		1,787
TOT (Food Science UAS Bachelor, ETHZ Food Science Program, ETHZ Related Programs)								2,510

For our analyses we pool the observations over all cohorts<sup>3</sup> to have a sufficiently large sample. This leaves us with 304 observations from food science graduates of universities of applied sciences (bachelor program), 209 observations from food science graduates of ETH Zurich at bachelor level, 145 observations from food science graduates of ETH Zurich at master level, and 65 observations from food

<sup>3</sup> We check in the first part of this section, whether there are differences over time but there were none.

science graduates of ETH Zurich at doctorate level. Thus, we have in total 419 observations of food science graduates of ETH Zurich and 1,787 observations on graduates from related programs at ETH Zurich.

### **Reforms of the Food Science Study Program at ETH Zurich**

After 2000 the introduction of the Bologna reform led to bachelor and master study programs at universities and universities of applied science. The bachelor program in food science at ETH Zurich was introduced in 2003 and the master program in food science at ETH Zurich in 2006. From 2008 onwards most graduates had switched from the “Lizenziat” to the Bologna model.

Major reforms in the food science study program at ETH Zurich took place in 2010 and 2016 for the bachelor program and in 2016/2017 for the master program according to our source at the food science department. These reforms might affect the students enrolling into the food science program but also their education and their labor market perspectives. Therefore, we compare the data before the reform with data after the reform. Table 4 in the appendix shows the means and standard deviation for the entire period (all), the pre-reform period (2008-2012) and the post-reform period (2014-2018). Further the table displays the difference between the means and the t-value. In no case is the t-value above 2, so there is no significant difference between the two means for any variable. Thus, we expect no significant influence of the reform.

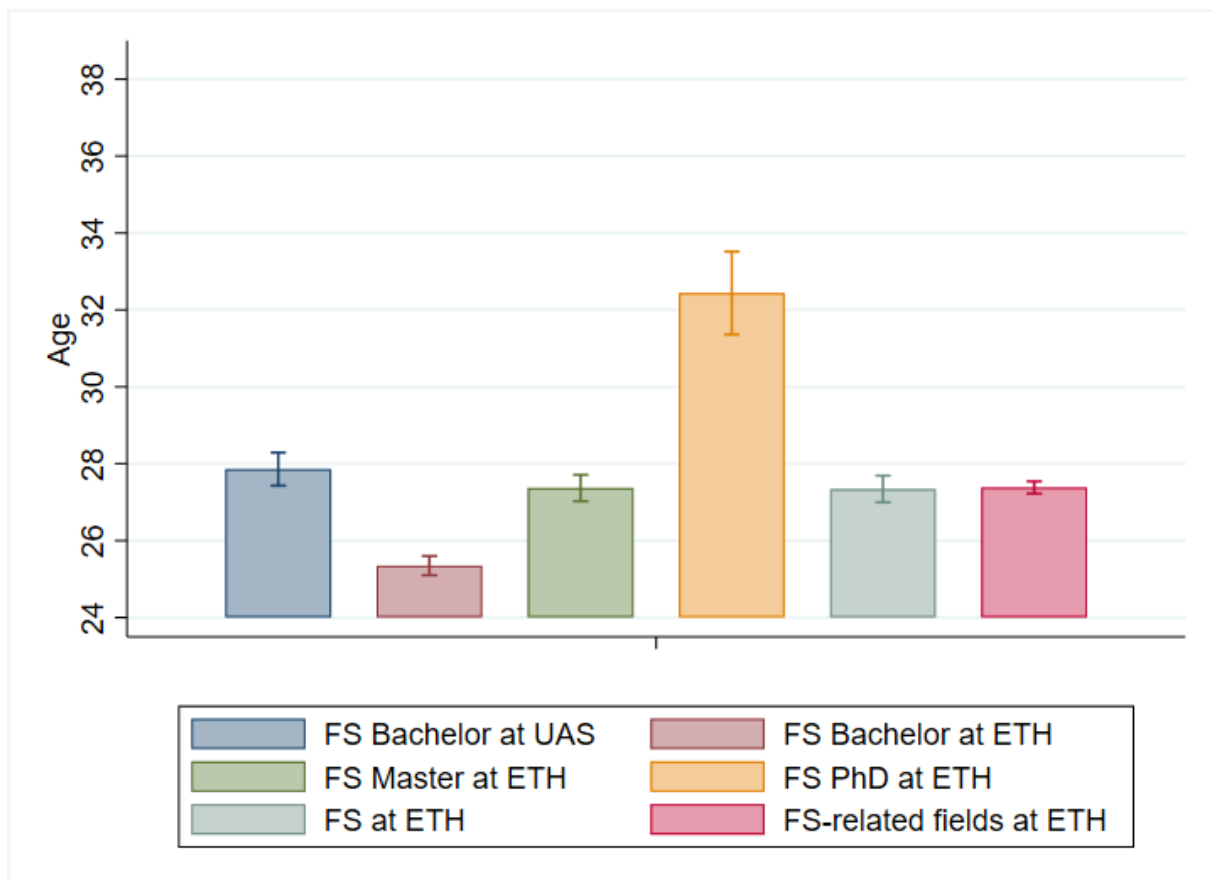
### 3 Who Graduates from Food Science

To get a first impression on graduates from the food science programs, we have a look at socio-demographic variables such as age, gender and nationality. Moreover, we consider the previous work experience graduates brought with them when they entered the program.

#### 3.1 Age

From Figure 1 we see that the average age of graduates from universities of applied sciences one year after graduation is 28, whereas the average age for graduates from the ETH Zurich bachelor program in food science is roughly 25, from the master program roughly 27 and from the doctoral program 32. The average age of graduates from any food science program at ETH Zurich one year after graduation is practically the same as for graduates from related programs (slightly more than 27).

*Figure 1: Age of graduates one year after graduation from the food science programs or food science related programs*

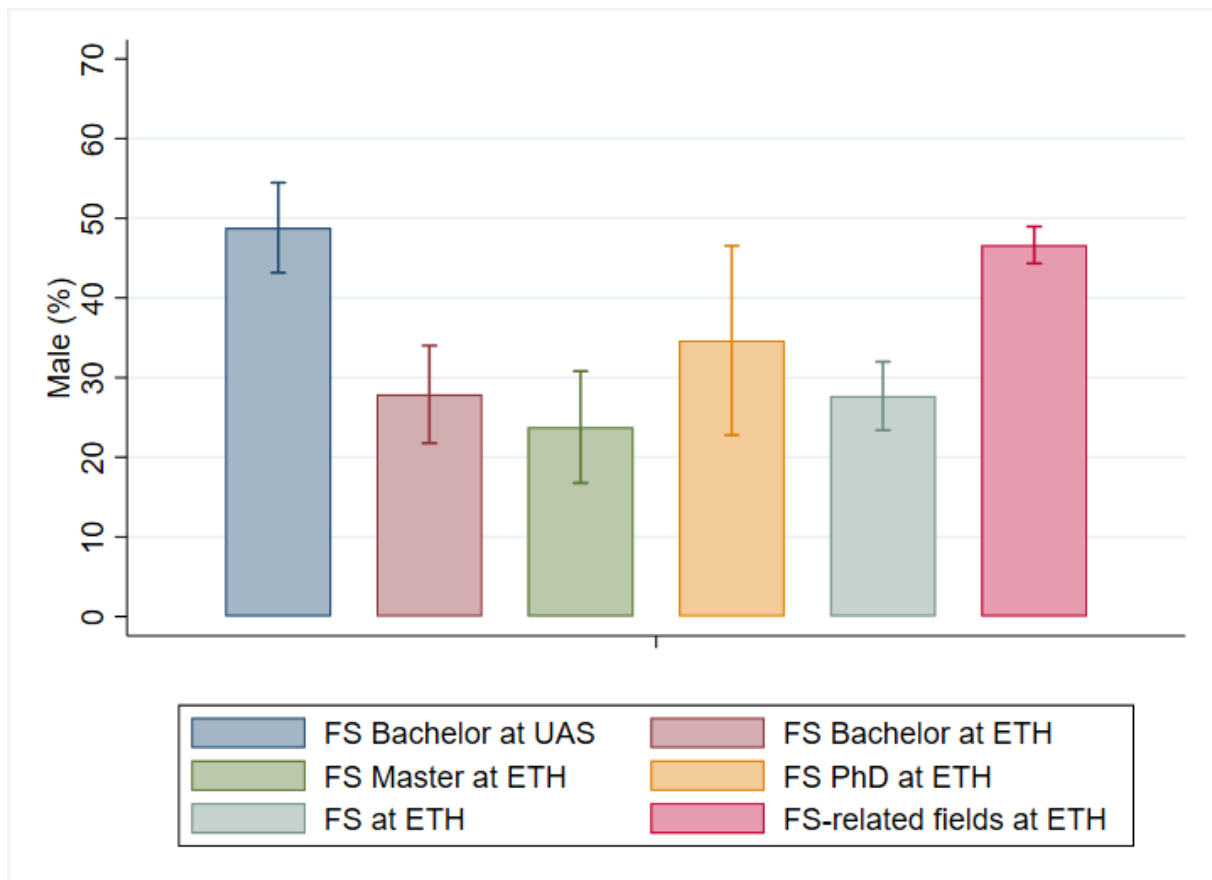


*Notes* This figure shows the average age of graduates one year after graduation for six different study programs. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

## 3.2 Gender

In Figure 2 we display the share of male graduates one year after graduation. Graduates from universities of applied sciences have a similar share of men and women (~49% male graduates), whereas graduates from ETH Zurich are predominantly female (72% in the bachelor program, 77% in the master program, and 65% in the doctorate program). Comparing the average share of male graduates in the food science programs at ETH with the share of male graduates in field-related subjects, we see again a lower share of male students (28% vs. 48%).

*Figure 2: Gender of graduates one year after graduation from the food science programs or food science related programs*

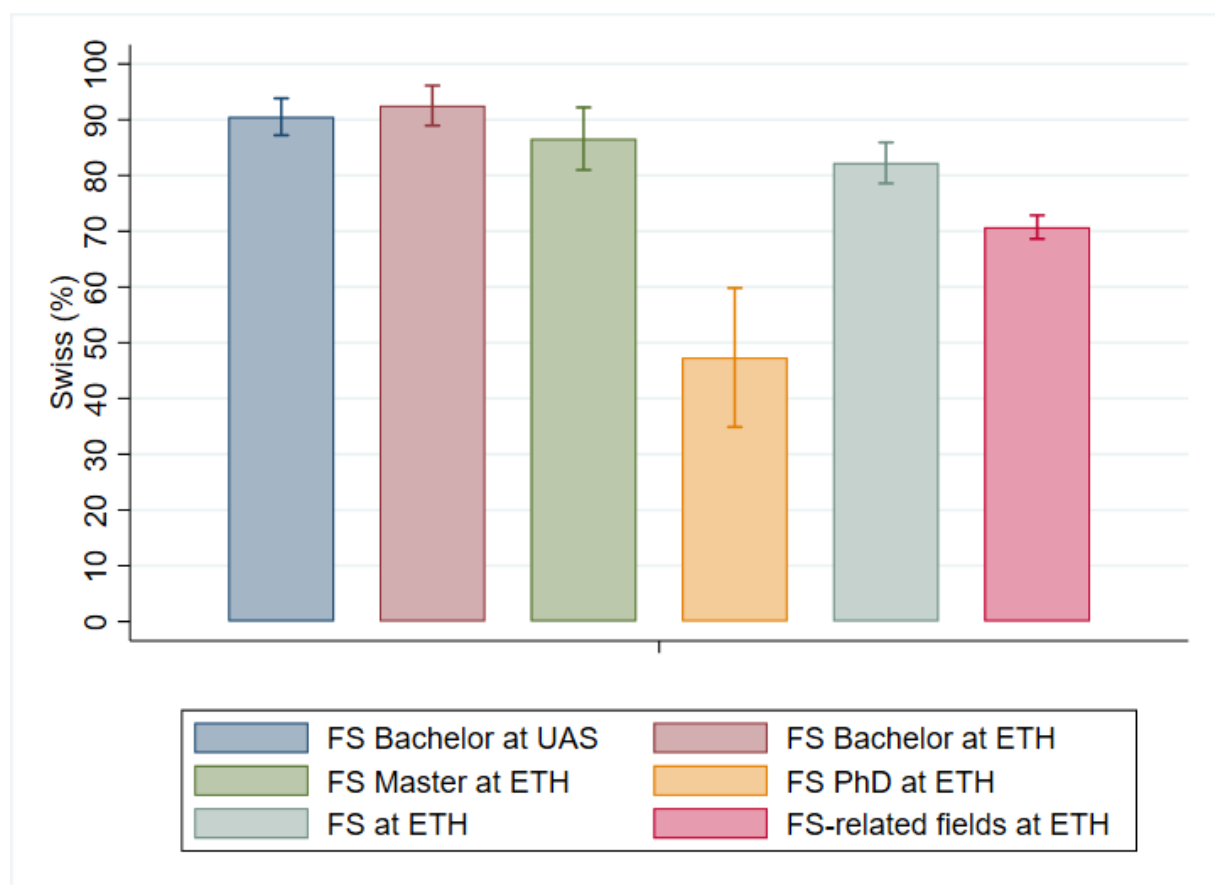


*Notes: This figure shows the average share of male graduates one year after graduation for six different study programs. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.*

### 3.3 Nationality

In all food science programs, except for the doctorate at ETH Zurich, the majority of graduates has the Swiss nationality (see Figure 3). For graduates from the bachelor programs this number is as high as 90%, for both the program from universities of applied sciences and ETH Zurich. The share in the master program of ETH Zurich is slightly lower at 87% and it drops to 48% in the doctorate. Compared to related -programs at ETH Zurich the food science program has clearly more graduates with Swiss background (70% vs 82%). Other nationalities of graduates are German and Italian,

*Figure 3: Nationality of graduates one year after graduation from the food science programs or food science related programs*



*Notes: This figure shows the share of graduates with a Swiss nationality one year after graduation for six different study programs. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.*

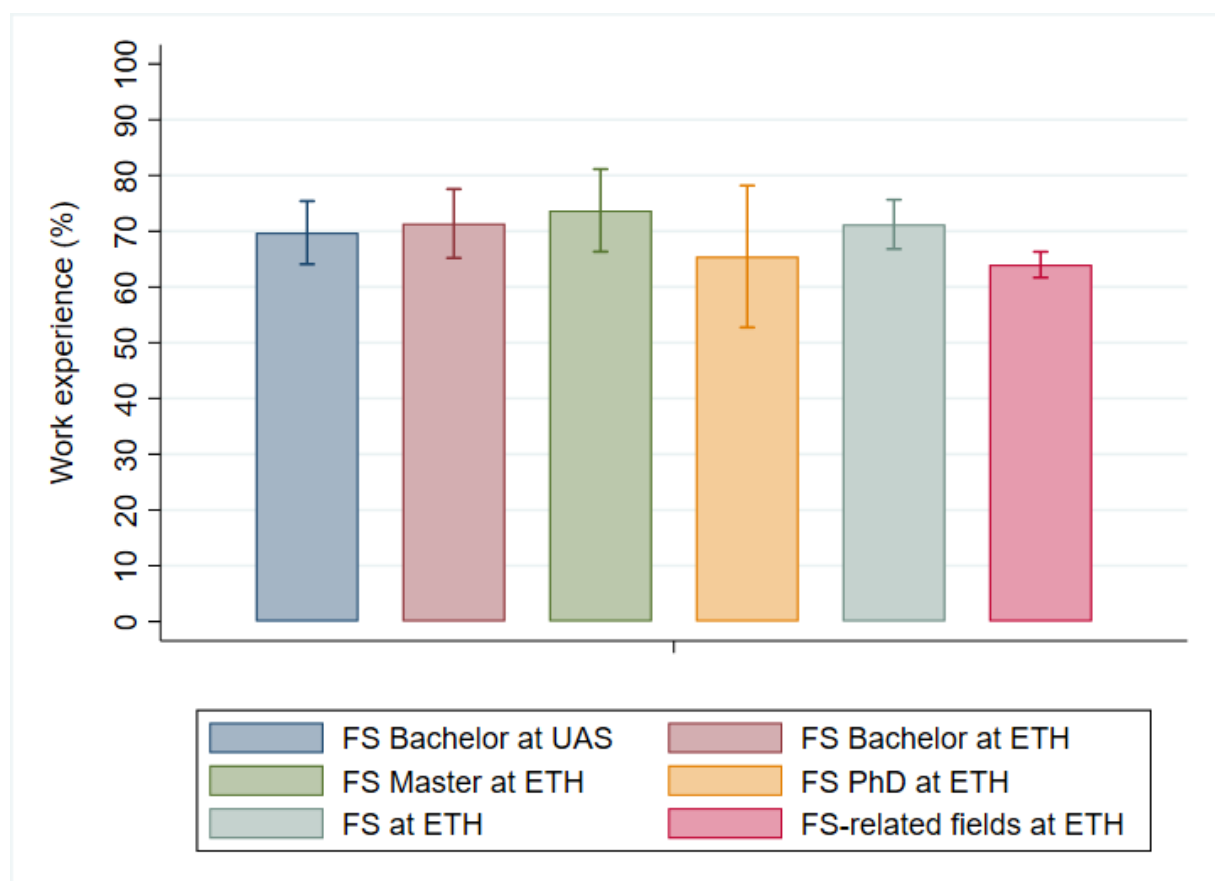
### 3.4 Prior Work Experience

Another interesting observation is about the presence of prior work experience. This holds some indication about the graduates' career pathway. We consider whether graduates had any prior work experience and separately whether that prior work experience is study field-related. Then, we also examine how much stems from choosing a vocational education and training program at upper secondary level.

#### General Prior Work Experience

A large share of graduates indicate having had work experience before entering the study program. Figure 4 displays the share for all programs. In both bachelor programs at university of applied sciences and ETH Zurich about 70% had obtained work experience before entering the program. Graduates from the master program at ETH Zurich had with 75% slightly more work experience, whereas graduates from the doctorate program at ETH Zurich had slightly less 65%. Comparing graduates from the food science programs at ETH Zurich with graduates from field-related programs at ETH Zurich we see that on average graduates from the food science program had significantly more work experience (70% vs. 64%).

Figure 4: Prior work experience of graduates one year after graduation from the food science programs or food science related programs

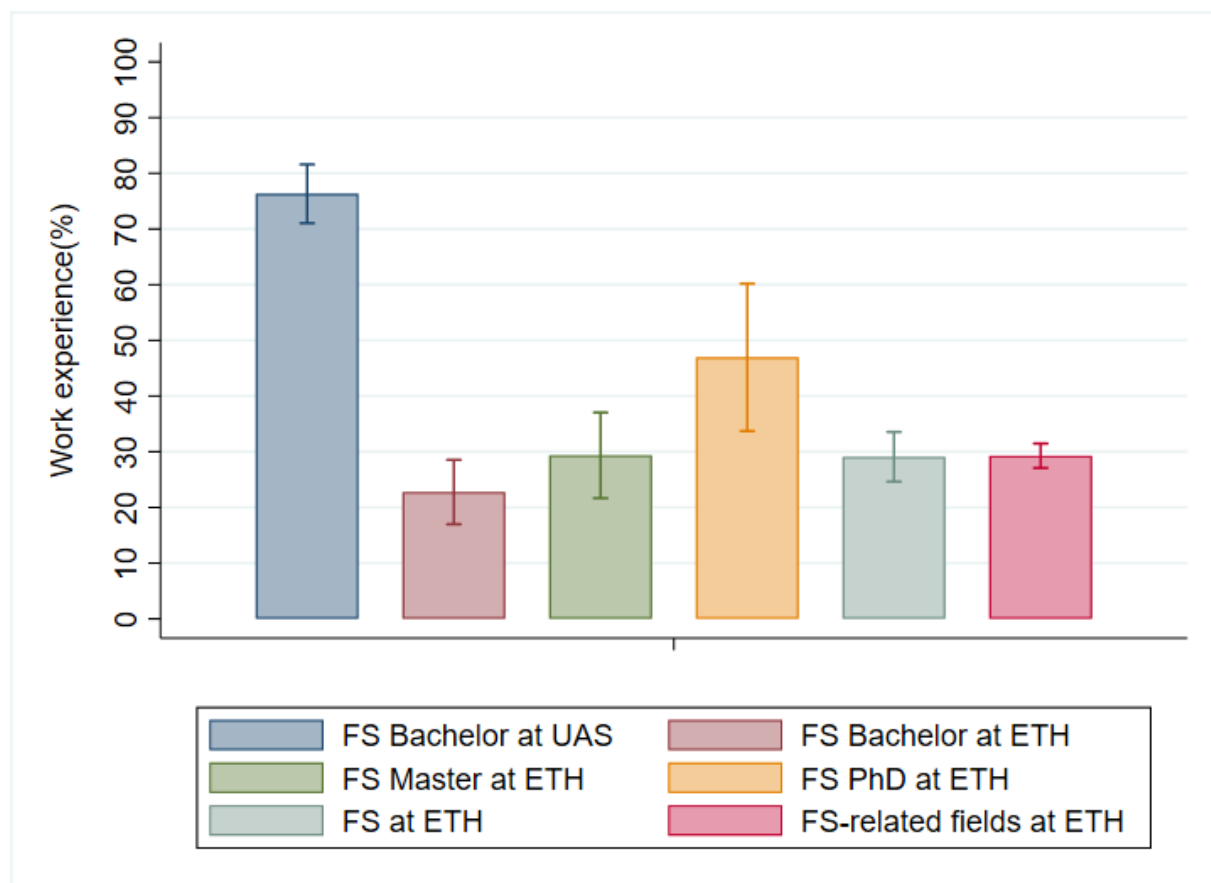


Notes: This figure shows the share of graduates one year after graduation with some work experience prior to studying for six different study programs. The study program “FS-related fields at ETH” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

### Related Prior Work Experience to Study Program

Figure 5 shows the share of graduates with prior work experience related to the study program. Here the pattern is different than in the general prior work experience. Graduates of universities of applied sciences report a high share of related prior work experience to the food science program (77%). This may be due to the fact that entry into a UAS program requires "relevant" prior education, i.e., vocational education and training that is related to the field of study. For the graduates of ETH Zurich, the ones from the bachelor program indicate 22% related prior work experience, the ones from the master program 30% and the ones from the doctorate program 48%. However, there is no difference in related prior work experience for graduates between the food science program at ETH Zurich and the field-related programs at ETH Zurich (both 29%).

Figure 5: Prior work experience related to the study field of graduates one year after graduation from the food science programs or food science related programs

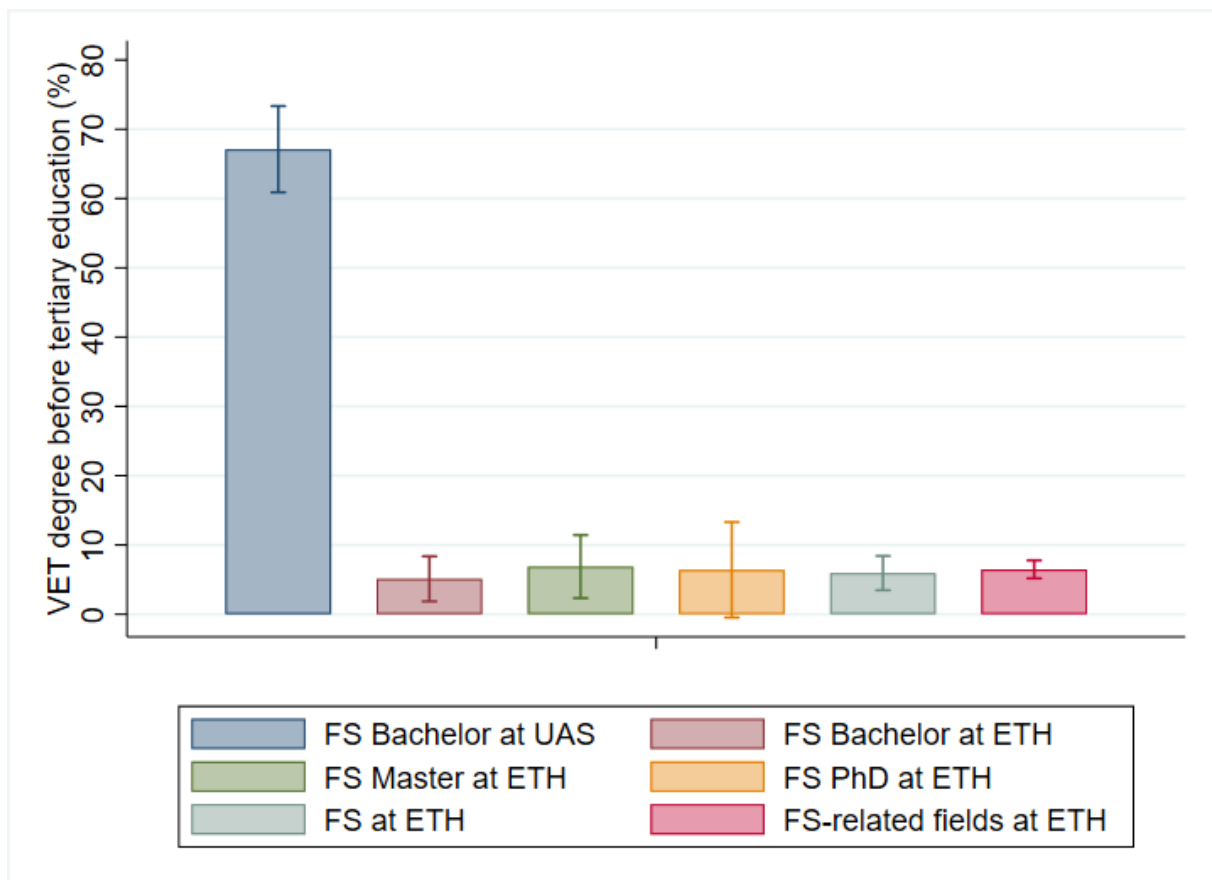


Notes: This figure shows the share of graduates one year after graduation with some study-relevant work experience prior to studying for six different study programs. The study program "ETH graduates in FS-related fields" consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

### Vocational Education and Training Diploma

In Figure 6 we display the share of graduates with a vocational education and training degree in upper secondary education. About 67% of graduates from food science programs at universities of applied sciences have a vocational education and training degree. This is much more than any other program in food science or the related programs and is based on legal regulation. The shares for the food science programs at ETH Zurich are about 5% in the bachelor program, 7% in the master program, and 6% in the doctorate program. These numbers are comparable to the average in the related programs (6%).

Figure 6: Graduates with a vocational education and training degree one year after graduation from the food science programs or food science related programs



Notes: This figure shows the share of graduates one year after graduation with a vocational education and training diploma prior to studying for six different study programs. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

## 4 Graduates' Satisfaction with Food Science

The Swiss Graduate Survey contains three question batteries about graduates' satisfaction. One is about the satisfaction with their study program, one is about the satisfaction with the match between the food science program and employment, and one is about the satisfaction with the current employment. The first battery about the program satisfaction is asked only to graduates one year after graduation, whereas the other two batteries—satisfaction with the match and the current employment—are asked to graduates one year and five years after graduation.

### 4.1 Satisfaction with Study Program

In the survey, graduates had to answer a block of questions about their satisfaction with their study program. The question is *“To what extent was your degree a good foundation for ...”*. The answer is on a five point Likert scale, whereby 1 stands for *“not at all”* and 5 for *“to a vast extent”*.

Table 2 summarizes the means for satisfaction of graduates one year after graduation with the study program concerning six areas. There is some variation among the aspects, whereby the lowest value is 2.7, which is slightly below neutral satisfaction and the highest value is 4.4 indicating high satisfaction.

*Table 2: Satisfaction of graduates one year after graduation with their study program*

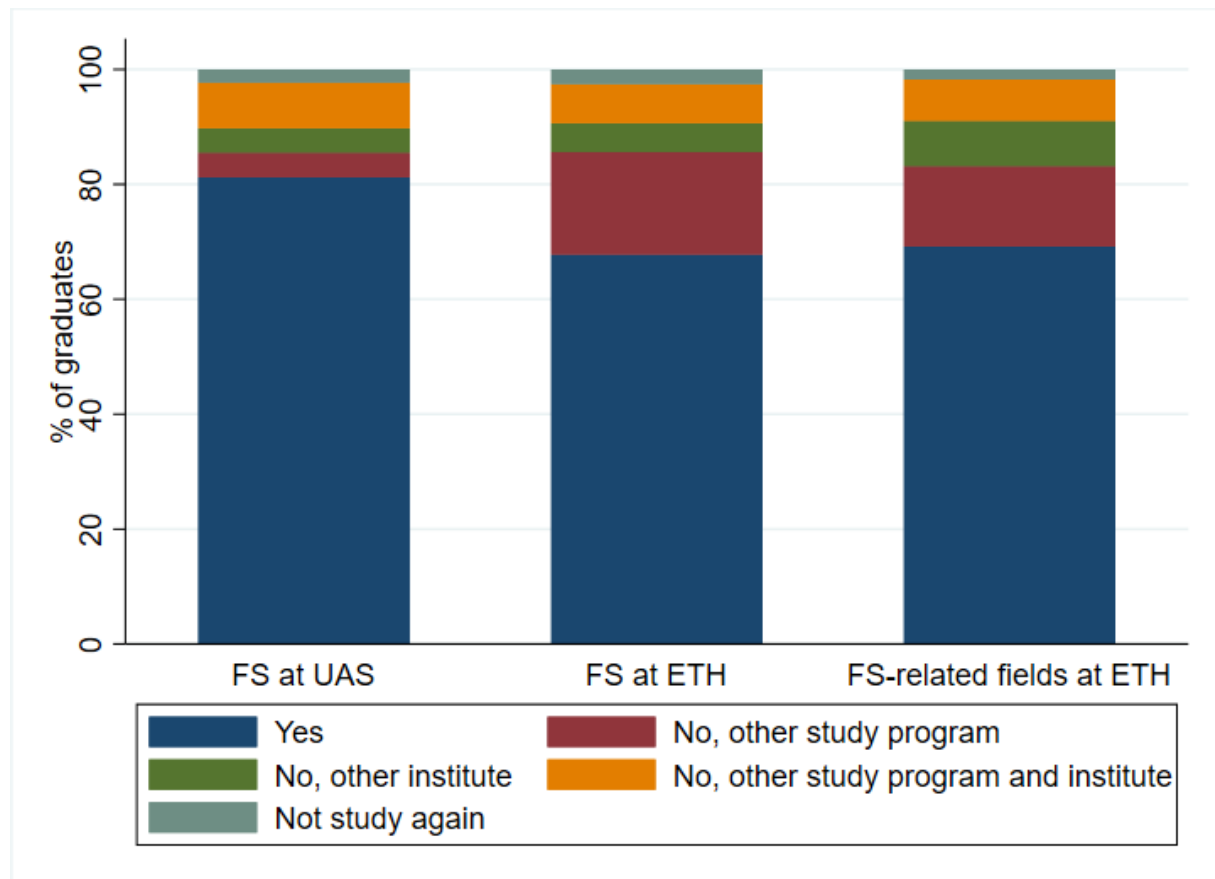
Satisfaction with...	BA UAS	BA ETH	MA ETH	PhD ETH	FS ETH	FS related ETH
... labor market entry	3.8	2.9	3.7	3.2	3.3	3.4
... further education	3.7	3.3	3.5	3.2	3.3	3.4
... current task	3.6	3.3	3.5	3.8	3.5	3.7
... future career	4.2	4.0	4.2	3.8	4.0	4.1
... personal development	4.2	4.1	4.4	4.4	4.2	4.2
... decide master program	2.7	4.1	-	-	4.1	4.2
Average	3.7	3.6	3.9	3.7	3.7	3.8

*Notes: This table displays the average satisfaction of graduates one year after graduation with their study program for six different study programs. BA stands for bachelor, MA for master and FS for food science. The study program “FS related ETH” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science.*

The overall picture is that graduates with a master degree from ETH Zurich or related ETH programs are most satisfied with the study program. All graduates report high satisfaction in the food science program for their future career and their personal development. The least satisfied are bachelor graduates from UAS with the program's foundation for deciding on a master program (2.7), whereas bachelor graduates from ETH Zurich are least satisfied with the program's foundation for the labor market entry (2.9). However, the standard degree for students in food science at ETH Zurich to enter the labor market is a master degree. Comparing the food science program at ETH with related study programs we find overall similar satisfaction levels.

Additionally, graduates were asked whether they would redo their study program again at the same institution (see Figure 7). The majority of graduates would, whereby graduates from UAS would redo the food science program at their institute the most (80%). The average at the food science programs of ETH Zurich is around 68% which is about the same as in the food science related programs of ETH Zurich.

Figure 7: Would you redo your study program at the same institute?



Notes: This figure shows the share of graduates one year after graduation who would redo their study program at the same institute for three different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

## 4.2 Satisfaction with Match of Study Program to Employment

The second battery of questions asks “In your opinion, to what extent is your current employment appropriate for your training?”, which we take as a measure for the graduates’ satisfaction with the match of their study program to their employment. Graduates could answer again on a five point Likert scale with 1 standing for “not at all” and 5 for “to a vast extent”. The question is asked one and five years after graduation.

The question is asked separately for four areas: position, task, professional qualification, and wage. The average satisfaction with the match of the study program with the current position is on average 3.9,

with the task 2.8, with the professional qualification 3.6 and with the wage 3.4. There is no significant variation among graduates and also not between the answers one and five years after graduation. Figure 24 to Figure 27 in the appendix display the results for graduates from the different programs and the two waves separately.

### 4.3 Satisfaction with Current Employment

Not only the satisfaction with the study program is important but also the satisfaction of the employment graduates are able to obtain after the study program. Therefore, we also include a third battery of questions. Here the question is *“To what extent are you satisfied with your current employment?”*. Graduates could answer on a 5-point Likert scale where 1 stands for *“not satisfied at all”* and 5 for *“very satisfied”*. This question is asked in the questionnaires one and five years after graduation.

The question has different focus areas, which are task content, intellectual and physical stress, workload, social status, working conditions, career opportunities, occupational qualification, and responsibility. The average value for the satisfaction about the task content is 4, for intellectual and physical stress 3.8, for workload 3.6, for social status 3.7, for working conditions, 4, for career opportunities 3.2, for occupation qualification 3.8 and for responsibility 3.9. The variation between the programs and the waves are not statistically significant. Figure 28 to Figure 35 in the appendix display the results in detail.

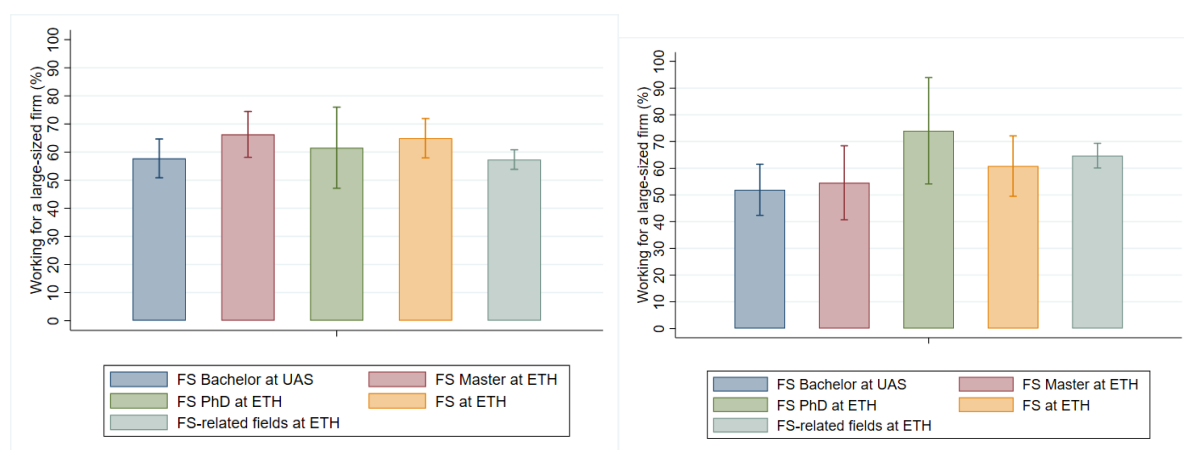
## 5 Job Profile of Food Science Graduates

This section focuses on the profile of food science graduates. After presenting the characteristics of the firms in which graduates work, we turn our focus to the skills that graduates acquired in education and the ones that they use in their current job. The section concludes by describing further education that graduates might have pursued after the end of their studies.

### 5.1 Firm Size

Figure 8 shows the percentage of graduates working in a large firm – firms with at least 250 employees – one year and five years after graduation. Compared to food science graduates from UAS, food science graduates from ETH are more likely to work in large firms (65% vs 58% after 1 year; 60% vs. 52% after 5 years). Over the degrees at ETH – bachelor, master and PhD – we observe small differences in the probability of working for a large firm one year after graduation. Five years after graduation these differences are larger, although not statistically different from one another.

Figure 8: Graduates working for large-size firms



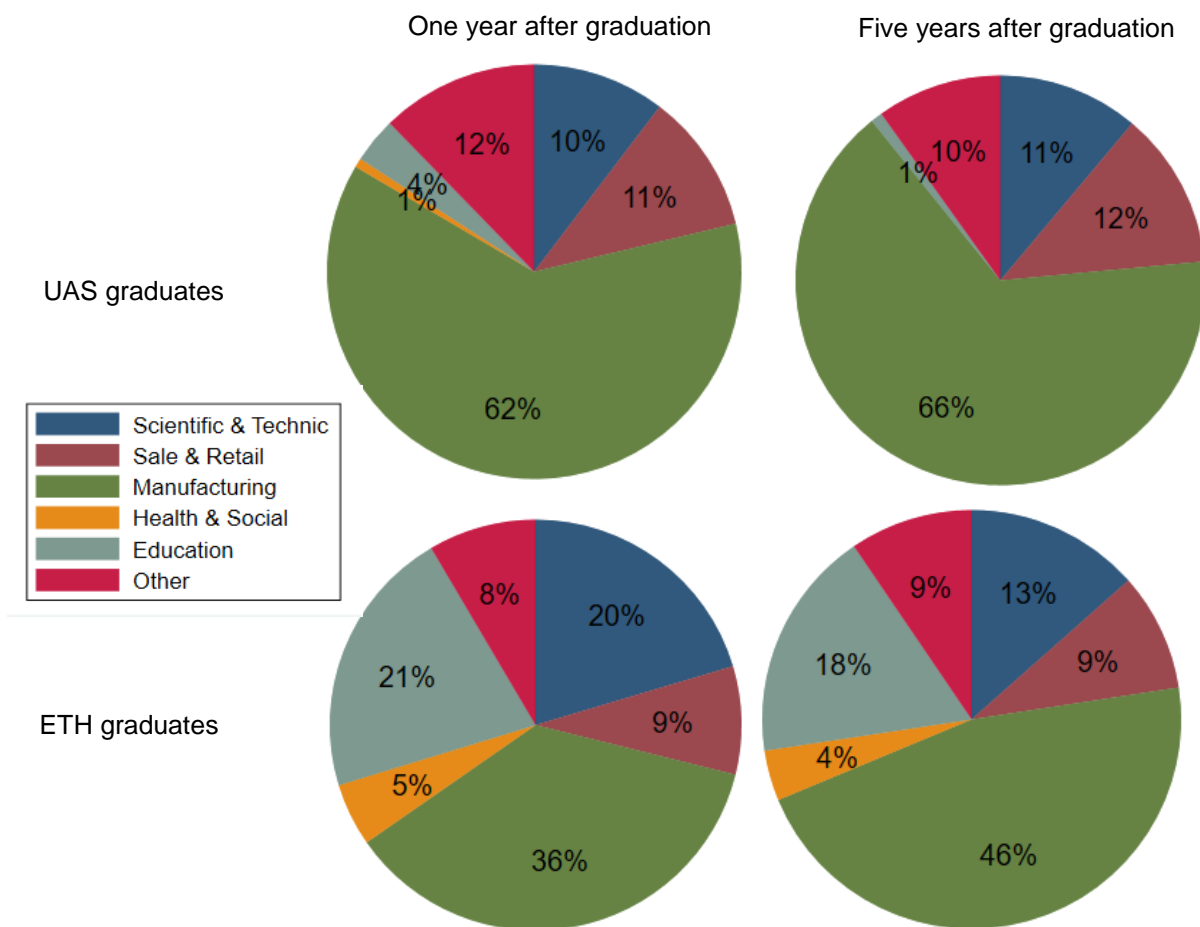
Notes: This figure reports the percentage of graduates working in large-size firms ( $\geq 250$  employees) one year (left) and five years (right) after graduation for five different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

### 5.2 Industry

Figure 9 shows the percentage of food science graduates by industry one year and five years after graduation. According to this figure, graduates from ETH are more likely than UAS graduates to work in the “scientific and technic” industry, in the “health and social” or in the “education” industry. In contrast, UAS graduates are clearly more likely to work in the “manufacturing” industry. Finally, both UAS and ETH graduates are almost equal likely to work in “sale and retail” industry.

Five year after graduation, the portion of UAS graduates working in the “manufacturing” industry reached about two third, while among ETH graduates less than every second is active in this industry. The percentage of ETH graduates working in the “education” industry is slightly lower than one year after graduation, but much higher than those of UAS graduates. ETH graduates are also less likely to be in the “scientific and technic” industry, so that five year after graduation the proportion in this industry is similar to those among UAS graduates. Finally, although not reaching a considerable percentage, a proportion of ETH graduates are still active in the “health & social” industry, while among the UAS graduates practically none is active in this industry

Figure 9: Graduates by industries



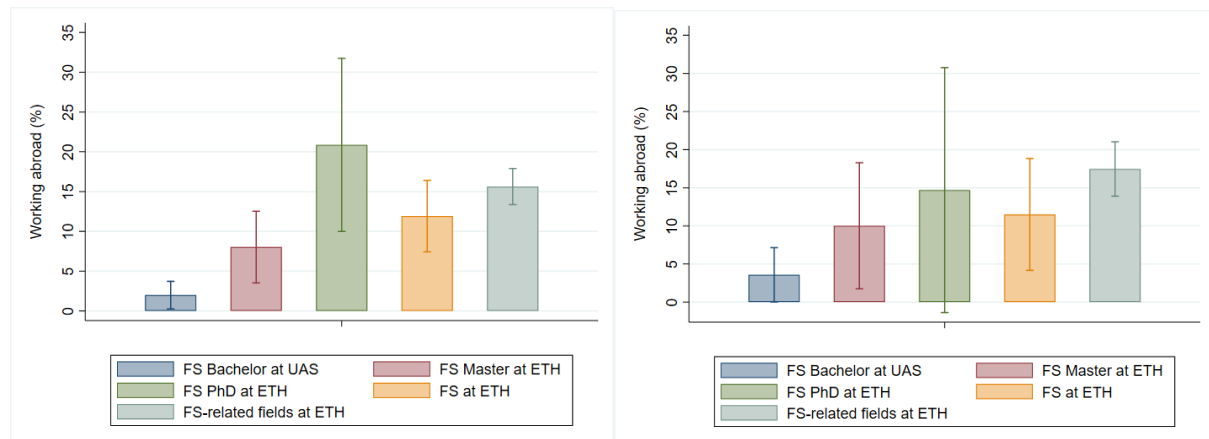
Notes: This figure reports the percentage of UAS and ETH graduates one year (left) and five years (right) after graduation.

### 5.3 Working Abroad

Figure 10 shows the percentage of graduates working abroad one and five years after graduation. Compared to food science graduates from UAS, food science graduates from ETH are more likely to work abroad (12% vs. 2% after 1 year; 11% vs. 4% after 5 years). Over the degrees at ETH – master and PhD – we observe a higher percentage of PhD graduates working abroad, although the difference is not

statistically significant. The percentage of food science graduates from ETH working abroad is statistically no different from those of ETH graduates in food science related field, both one year and five years after graduation.

Figure 10: Percentage of graduates working for abroad



Notes: This figure reports the percentage of graduates working abroad one year (left) and five years (right) after graduation for five different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

## 5.4 Most Frequent Occupations

To further characterize the job profiles of food science graduates, we focus now on the most frequent occupations that graduates take one year after graduation. Table 3 lists the most frequent occupations of food science graduates from ETH and UAS one year after graduation.

A comparison across the two tables reveals that ETH and UAS graduates take to large extent similar occupations, but with different frequencies. Especially, ETH graduates are more likely of taking more “intellectual and scientific professions” as well as being “chemists”, “managers in the production of goods” or “project managers”. In contrast, UAS graduates are more frequently working as “chemical engineers”, as “managers in the production of goods” or as “Marketing and advertising professions” or also as “project managers”. Differently from ETH graduates, graduates from UAS are also more frequently working or as “operators of machines for food & beverages production”. In contrast, ETH graduates are relatively more frequently working as “scientists, mathematicians and engineers\* or as “biologists”.

*Table 3: The most frequent occupations of ETH and UAS graduates in food science*

Occupation's name	ETH	UAS
Intellectual and scientific professions	20%	2%
Chemical Engineers	9%	23%
Chemists	8%	1%
Managers in the production of goods	7%	15%
Project Managers	6%	6%
Marketing and advertising professions	5%	10%
Material and engineering specialists	4%	5%
Product testers and classifiers	4%	4%
Scientists, mathematicians and engineers	3%	1%
Operators of machines for food & beverages prod.	1%	6%
Technicians and equivalent non-technical professions	1%	4%
Biologists	3%	1%
Process and production engineers	2%	2%
Others	27%	20%
<b>TOT</b>	<b>100%</b>	<b>100%</b>
<b>N</b>	<b>186</b>	<b>243</b>

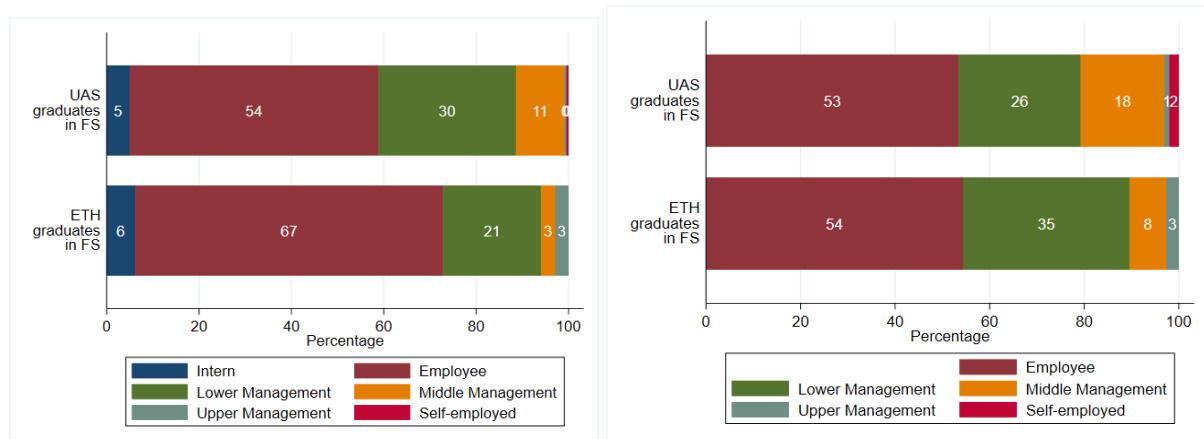
*Notes: This table displays the most frequent occupations of ETH and UAS graduates in food science one year after graduation.*

## 5.5 Position

Figure 11 shows the percentage of graduates in different management positions one year and five years after graduation. According to this figure, graduates from UAS are more likely than graduates from ETH to be in lower or middle management one year after graduation. In contrast, ETH graduates are more likely to be simple employees or part of the upper management. In both groups the proportion of interns is similar.

Five years after graduation, nobody is employed as an intern anymore. The percentage of workers without management position is now similar for both UAS and ETH graduates. Slightly more than every second graduate has no management position five years after graduation. Differences between UAS and ETH graduates are notable with regard to the management positions. On the one side, the percentage of UAS graduates with a middle management position is considerably higher than those of ETH graduates. On the other side, ETH graduates are relatively more likely to have either a lower management position or an upper management position, although these differences are small in magnitude. Finally, it is also noteworthy that UAS graduates are more likely to be self-employed.

Figure 11: Graduates' management position

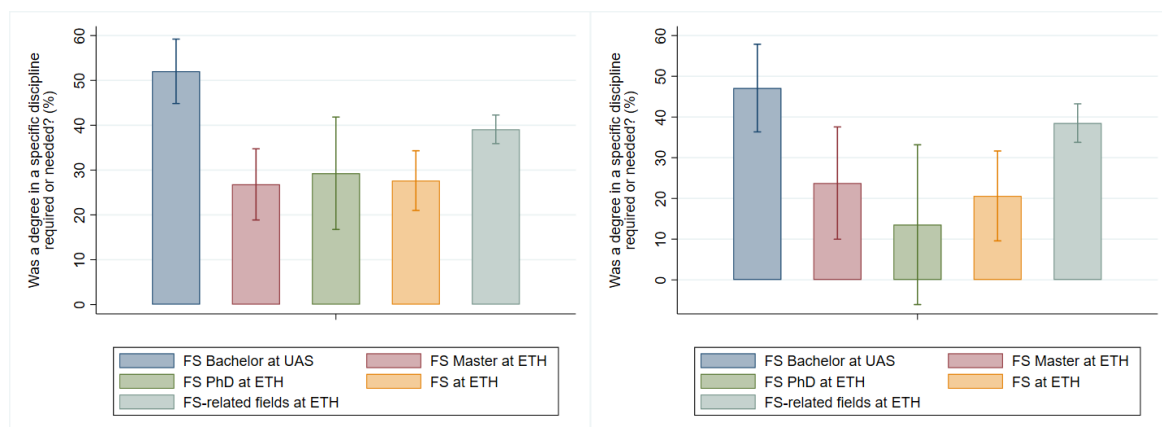


Notes: This figure reports the percentage of ETH and UAS graduates in different management positions one year (left) and five years (right) after graduation.

## 5.6 Skills Mismatch

The Graduate Survey offers the possibility to characterize the job profile of food science graduates according to their skills. Specifically, the survey asks respondents to self-assess if a degree in a specific discipline was required or needed for their current job, i.e. if the study field matches the occupation. The ILO (2013) defines a mismatch between the field of education and the occupation as horizontal skills mismatch. Figure 12 reports the percentage of graduates who report having a job for which a degree in a specific discipline was required, i.e. a measure of horizontal skills match. Compared to food science graduates from UAS, food science graduates from ETH are less likely to have a job for which a degree in a specific discipline was required (28% vs. 52% after 1 year; 20% vs. 47% after 5 years), and thus the degree of skills mismatch for them is larger than for UAS graduates.

Figure 12: Graduates' horizontal skills match

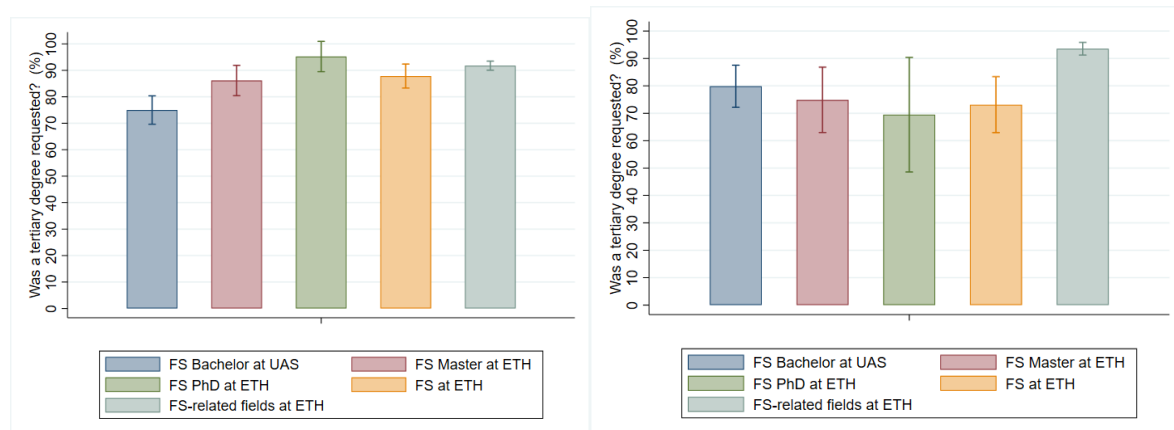


Notes: This figure reports the percentage of graduates' horizontal skills match one year (right) and five years (left) after graduation for five different study programs. FS stands for food science. The study program "ETH graduates in FS-related fields" consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

Another way of measuring skills mismatch is to consider if a tertiary degree was requested in order to perform the current job. The ILO (2013) defines this type of skills mismatch, in which the level of education or qualification is less or more than the one required at the job, as vertical skills mismatch. Figure 13 shows the percentage of graduates having a job for which a tertiary degree was required one year and five years after graduation, i.e. a measure of vertical skills match. Compared to food science graduates from UAS, food science graduates from ETH are more likely to have a job for which a tertiary degree was required one year after graduation (89% vs. 75%), and thus the degree of vertical skills mismatch for them is smaller than for UAS graduates. Worth mentioning is also that the vertical match is especially high for PhD graduates from ETH one year after graduation.

Interestingly, five years after graduation the differences between food science graduates from ETH and UAS are smaller. In contrast, the difference between ETH graduates in food science and ETH graduates in related fields is larger.

Figure 13: Graduates' vertical match



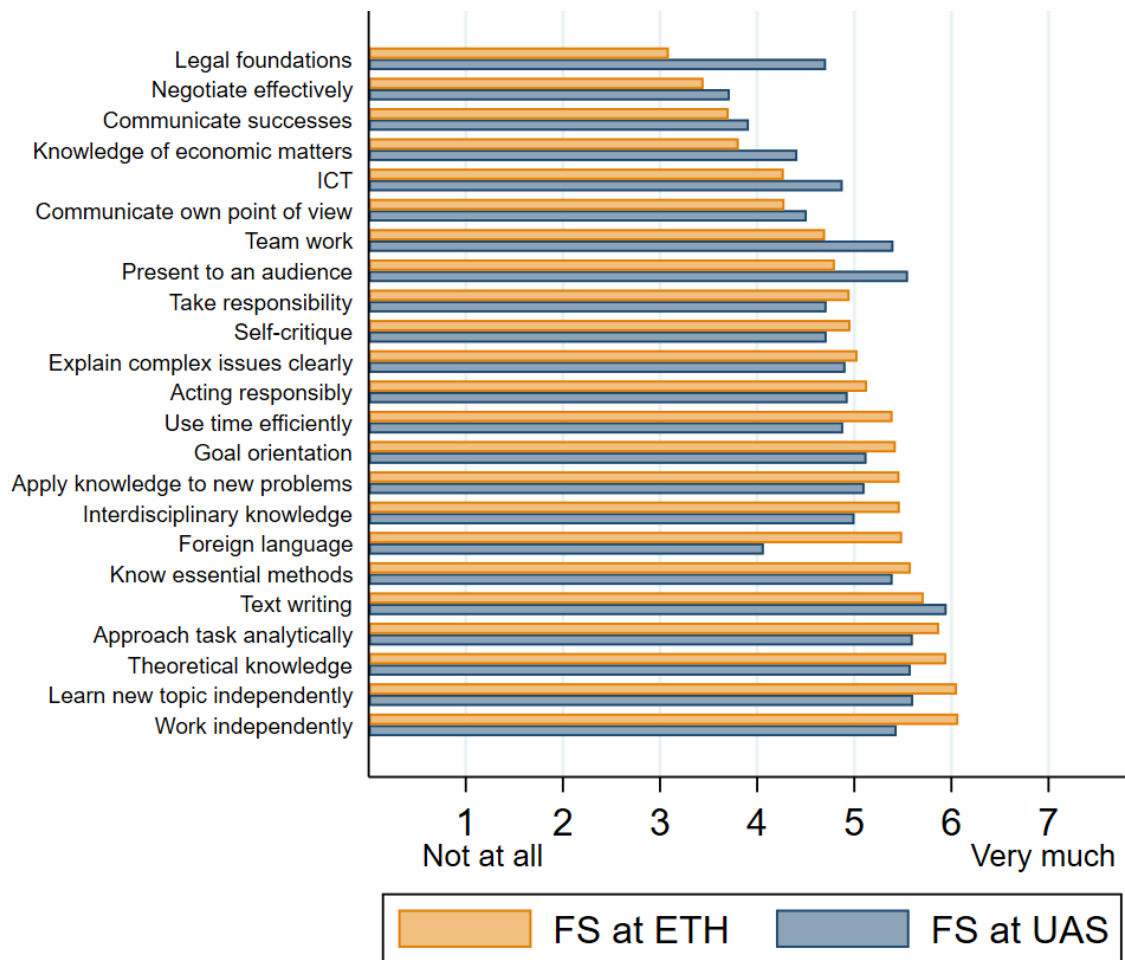
Notes: This figure reports the percentage of graduates' vertical skills match one year (left) and five years (right) after graduation for five different study programs. FS stands for food science. The study program "ETH graduates in FS-related fields" consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

## 5.7 Skills Acquired

The differences in the job profiles between ETH and UAS graduates might be explained by different skills they acquired during their studies. The Graduates Survey offers a set of questions in this regard as well. Concretely, graduates were asked one year after graduation to self-assess the skills acquired during their studies. The scale goes from 1 «Not at all» to 7 «Very much».

Figure 14 shows the average values for UAS and ETH graduates in the entire set of skills. Generally, we observe that there are no skills which are not acquired at all. Meanwhile, students report to have acquired many skills to a relatively large extent. Specific to the two groups, ETH graduates have relatively low levels of legal foundation and negotiation skills, while they are particularly well-equipped for learning a new topic and work independently. UAS graduates have also relatively low levels of negotiations skills but also in how to communicate success. In contrast, they have acquired competences in knowing the essential methods and presenting to an audience.

Figure 14: Graduates' skills acquired during studies



Notes: This figure reports ETH and UAS graduates' self-assessed skills acquisition during studies one year after graduation.

To highlight the disparities in acquired skills between ETH and UAS graduates, Figure 15 reports the difference in the mean and the corresponding 95% confidence interval. The difference is built by subtracting the mean of ETH graduates from those of UAS graduates. The vertical red line suggests no differences between UAS and ETH graduates. The skills left from the red lines, are the skills that have been acquired more by ETH than by UAS graduates. The skills right from the red line, are the skills that have been acquired more by UAS than by ETH graduates. Skills are grouped according to the ETH Competence Framework<sup>4</sup>, which classifies skills in subject specific, method specific, social, and personal skills.

Starting by considering the method-specific skills, Figure 15 suggests that ETH graduates in food science acquire slightly more skills that allow them to be more goal oriented and to approach tasks analytically. In contrast, UAS graduates in food science acquire clearly more ICT skills, and more knowledge in economic matters.

With regard to the subject-specific skills, ETH graduates acquire relatively more skills than UAS graduates. In particular, ETH graduates acquire relatively more skills that allow them to apply knowledge to

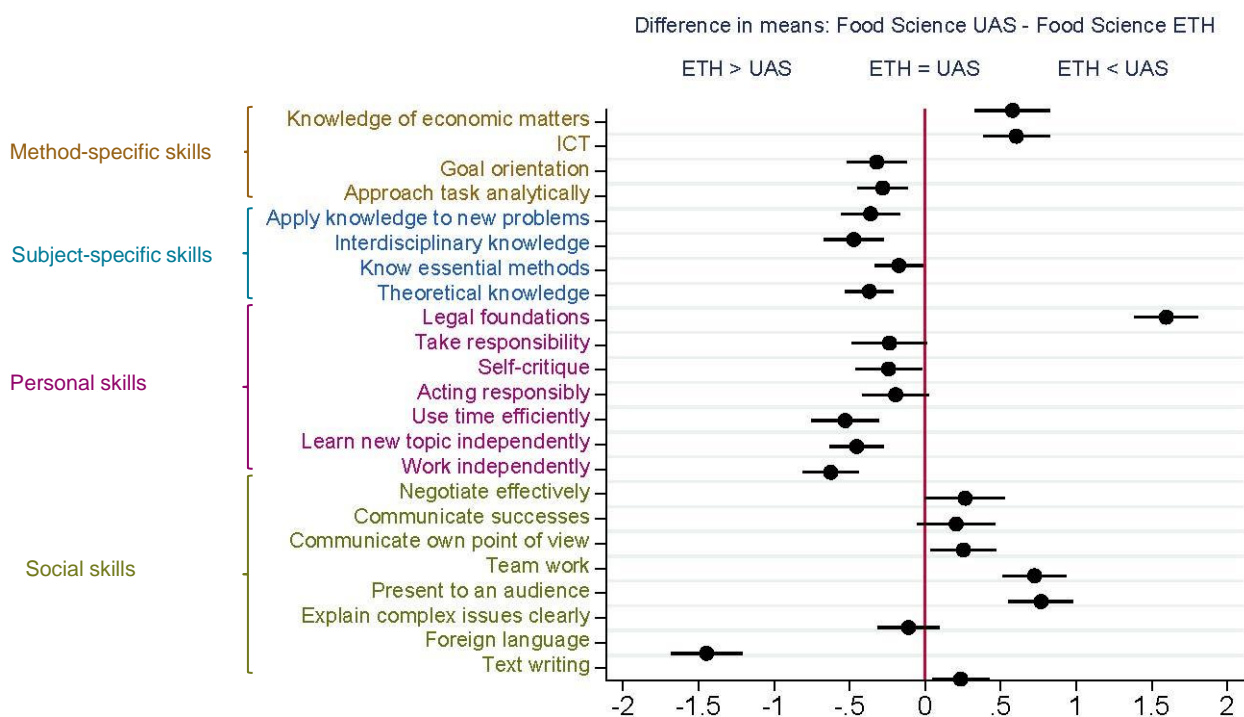
<sup>4</sup> See <https://ethz.ch/en/the-eth-zurich/education/policy/eth-competencies-teaching.html>

new problems, more interdisciplinary knowledge, and more theoretical knowledge in general. In contrast, both group of graduates affirm to be equally well-equipped in knowing the essential methods.

In the domain of personal skills, ETH graduates acquire relatively more skills that allow them to approach tasks analytically, more skills that allow them to use time efficiently, more skills that allow them to learn new topics independently, and more skills that allow them to work independently. In contrast, UAS graduates acquire clearly more skills in legal foundations.

Finally, UAS graduates have acquired more social skills, as for instance more skills related to team-work and more skills in presenting to an audience. In contrast, ETH graduates acquire clearly more skills in foreign language.

Figure 15: Difference in the skills acquisition during studies



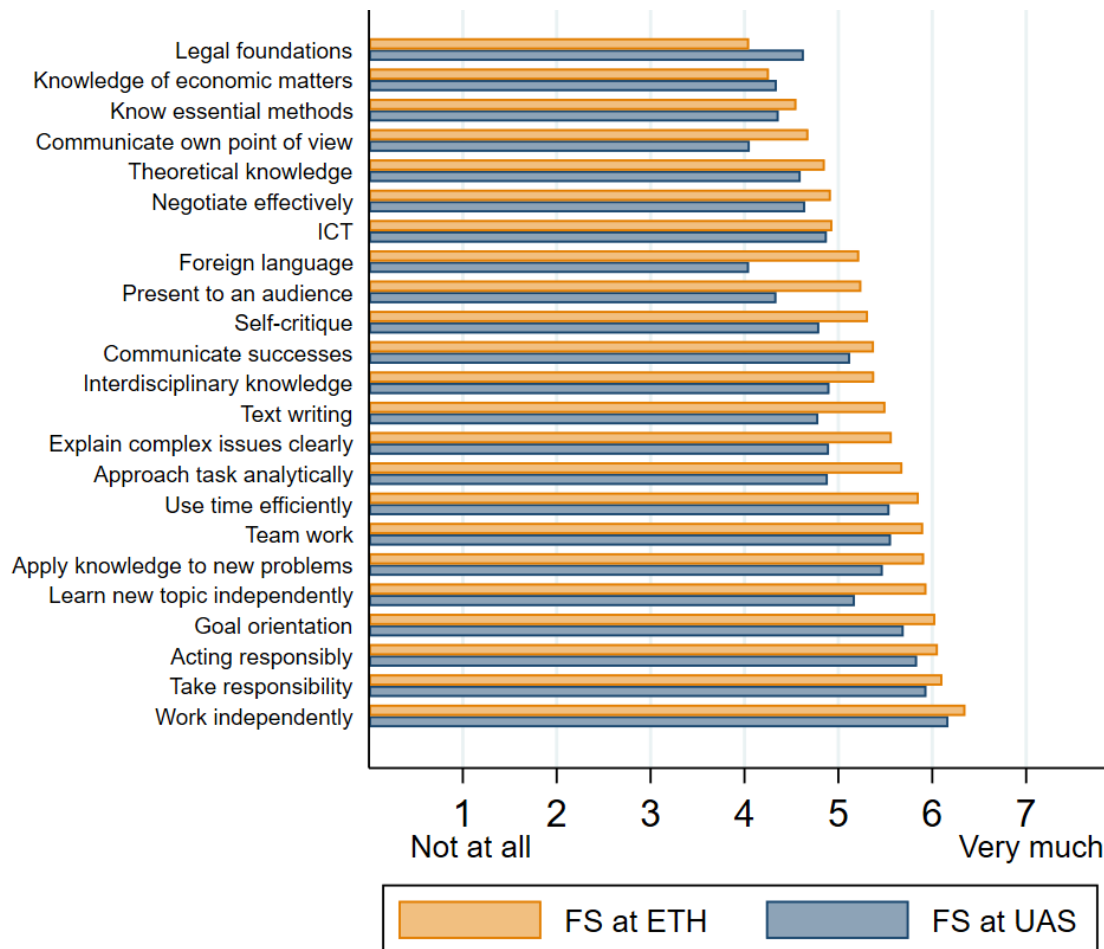
Notes: This figure reports the difference in mean between UAS and ETH graduates in the skills acquired during studies one year after graduation. Values left from the red lines means that those skills have been acquired more by ETH graduates; right from the line means acquired more required by UAS graduates. The horizontal lines reports the 95% confidence interval of the means' difference.

## 5.8 Skills Used

Besides the acquired skills, graduates were also asked about the skills required in their current job one year after graduation. Also in this case the scale goes from 1 «Not at all» to 7 «Very much». Figure 16 shows the average values for UAS and ETH graduates in the entire set of skills. Similarly as in the case of acquired skills, there are no skills which are not used at all. Conversely, graduates report to use many skills to a relatively large extent. Specific to the two groups, ETH graduates use relatively less skills building on legal foundation or economic matters, while are particularly inclined in working independently or in taking and acting responsibly. UAS graduates are less inclined in using foreign language skills or

in communicating their point of view. In contrast, similarly to ETH graduates, they are also particularly inclined in working independently or in taking and acting responsibly.

*Figure 16: Graduates' skills use in current job*



*Notes: This figure reports ETH and UAS graduates' self-assessed skills use in their job one year after graduation.*

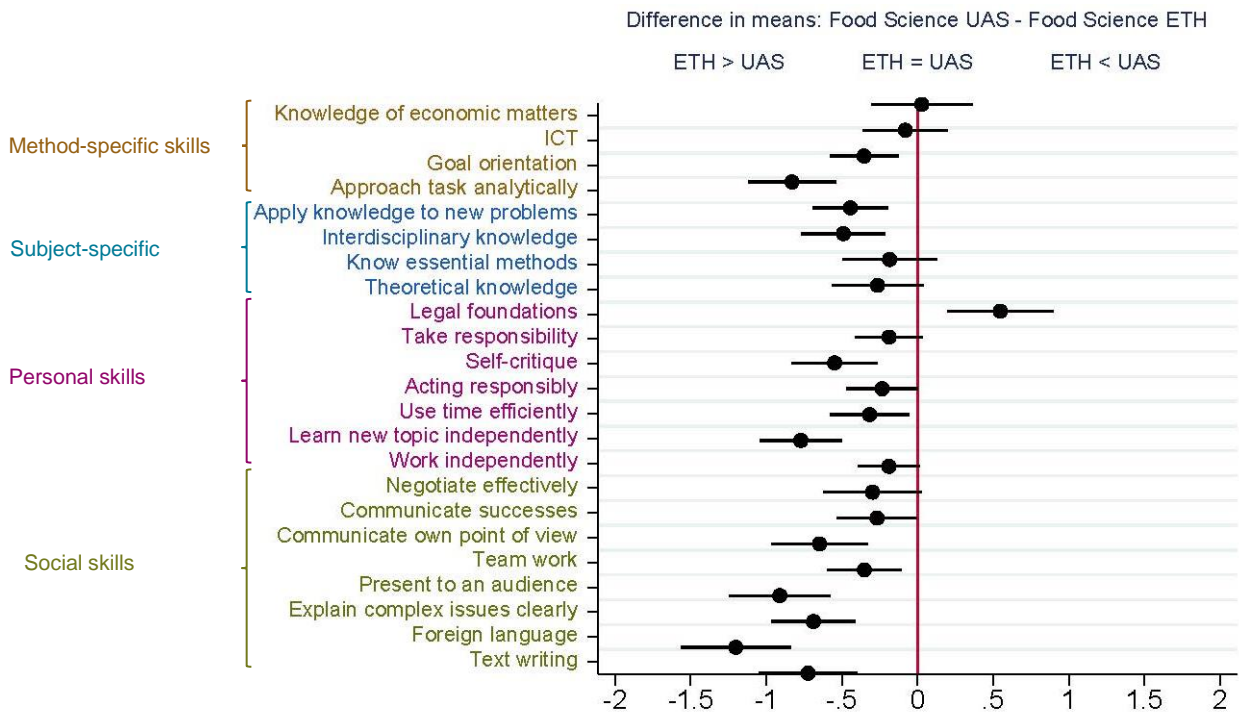
To highlight the disparities in skills used between ETH and UAS graduates, Figure 17 reports the difference in the mean and the corresponding 95% confidence interval. The difference is built by subtracting the mean of ETH graduates from those of UAS graduates. The vertical red line suggests no differences between UAS and ETH graduates. Left from the red lines means more required by ETH; right from the line means more required by UAS. Similarly as in the case of acquired skills, we group skills according to the ETH Competence Framework.

In terms of method-specific skills, ETH graduates use slightly more skills that allow them to be more goal oriented and to approach task analytically. With regard to subject-specific skills, ETH graduates use relatively more skills that allow them to apply knowledge to new problems and interdisciplinary knowledge in general.

In the domain of personal skills, ETH graduates use relatively more skills that require them to be more self-critical or to learn new topics independently. In contrast, UAS graduates use clearly more skills related to legal foundations.

Finally, although UAS graduates are generally better in acquiring social skills, ETH graduates use them more in their jobs. Concretely, they use relatively more skills in communicating their point of view, in presenting to an audience, or in explaining complex issues in a clear way. ETH graduates also clearly use more foreign language skills and writing skills.

Figure 17: Difference in the skills usage in current job



Notes: This figure reports the difference in mean between UAS and ETH graduates in the skills required in the current job one year after graduation. Values left from the red lines means that those skills are more used by ETH graduates; right from the line means more used by UAS graduates. The horizontal lines reports the 95% confidence interval of the means' difference.

## 6 Success on the Labor Market

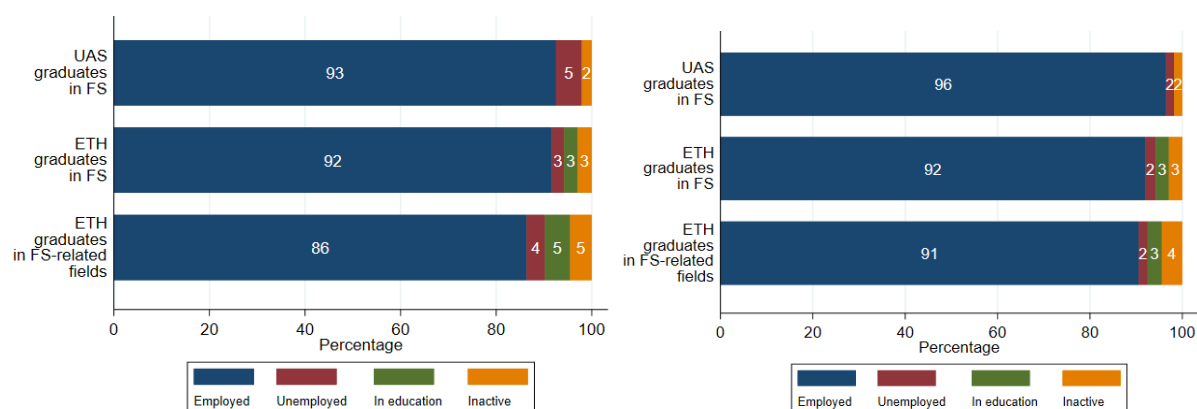
This section focuses on the labor market outcomes of food science graduates. We start by presenting the labor market status and then turn our focus to the labor income. We conclude by looking at the working conditions which graduates faces in their jobs.

### 6.1 Labor Market Status

Figure 18 shows the labor market status of food science graduates from ETH and from UAS graduates as well as of ETH graduates in food sciences related fields. The bar chart on the left hand side reports the labor market status one year after graduation, while the chart on the right hand side reports five years after graduation. This figure suggests that one year after graduation, the proportion of food science graduates from ETH and UAS being employed is very similar. UAS graduates are slightly more likely to be unemployed while ETH graduates in food science are more likely to be in education. A comparison between the two groups of ETH graduates suggests that food science graduates are more likely to be employed, while graduates in food science related fields are more likely to be either in education or inactive. Altogether, one year after graduation food science graduates from ETH are better integrated in the labor market than ETH graduates in food science related field.

However, as the chart on the left hand side suggests, this difference does not exist anymore five years after graduation. In contrast, the 96% of UAS graduates employed 5 years after graduation suggest an even better integration in the labor market. This difference between food science graduates from UAS and food science graduates from ETH can be only partially explained by a larger involvement of ETH graduates in education.

Figure 18: Graduates' labor market status



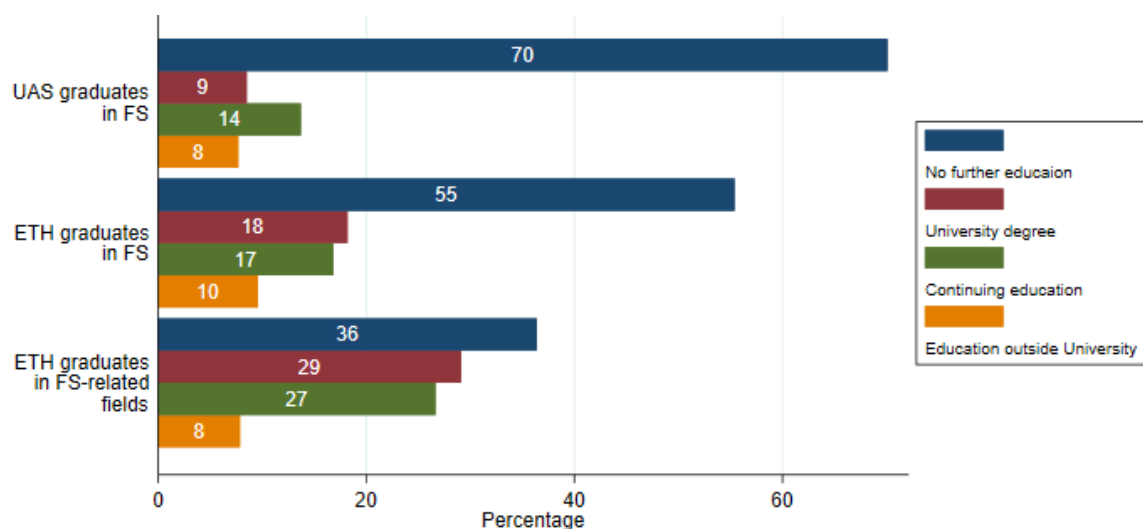
Notes: This figure reports graduates' labor market status one year (left) and five years (right) after graduation for three different study programs. FS stands for food science. The study program "ETH graduates in FS-related fields" consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science.

As highlighted by Figure 18, the percentage of graduates in full-time education is particularly low. However, in a number of cases, graduates undergo a further education beside their job. Therefore, with Figure 19 we investigate the type of further education undertaken by graduates. This figure shows the percentage of food science graduates from UAS and ETH as well as ETH graduates in food

science related fields participating in further education five year after graduation. The first remarkable pattern, is that more than two third of UAS graduates in food science do not participate in any form of further education five years after gradations. For ETH graduates this percentage is much smaller, although it is worth nothing that ETH graduates in food science participate much less in further education that their counterparts in food science related fields.

With regard to the different types of further education, UAS graduates participate relatively more often in continuing education, while ETH graduates are more likely to achieve a further university degree. Finally, all three groups of graduates considered in this figure participate in a similar proportion to further education outside university.

Figure 19: Graduates participation in further education



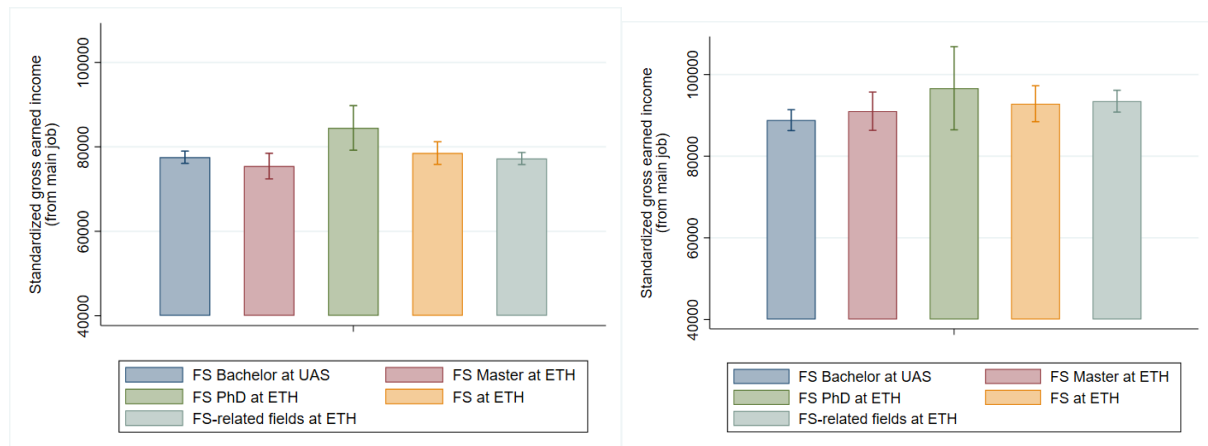
Notes: This figure reports the percentage of graduates participating in further education, five years after graduation for three different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science.

## 6.2 Income

Figure 20 shows the yearly gross earned income from the main job one year and five years after graduation. These values have been standardized, i.e. the earned income was adjusted to a workload of 100%. One year after graduation, food science graduates from UAS and ETH have a relatively similar income of about 78'000 CHF. This value is in line with the early gross earned income from ETH graduates in food science related fields. Lastly, the income of ETH food science graduates with a PhD degree is higher. However, probably due to the relatively low number of observations, this difference is not statistically different.

The chart on the right-hand side suggests that five years after graduation, the yearly gross earned income increase both for ETH and UAS graduates. Concretely, food science graduates from UAS earn on average 88'000 CHF, while ETH graduates 92'000. However, this difference, as well as the difference with the average income of graduates with a PhD, is not statistically significant.

Figure 20: Graduates' standardized gross earned income



Notes: This figure reports graduates' standardized gross earned income from the main job one year (left) and five years (right) after graduation for five different study programs. FS stands for food science. The study program "ETH graduates in FS-related fields" consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

## 6.3 Working Conditions

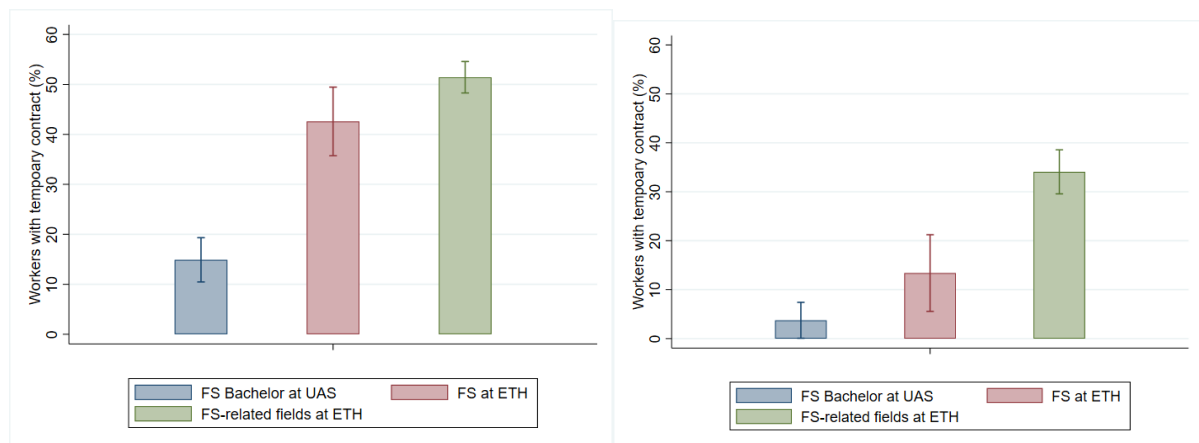
Besides the quantitative aspects such as income or the labor force participation, more qualitative aspects are also important to describe the success of food science graduates on the labor market. For this reason, we now focus on the working conditions which graduates faces once having found a job. Due to the relatively low number of answers from graduates with a PhD, we report values for ETH graduates in food sciences without distinguishing between master and PhD graduates,

### Temporary contract

We start by looking at the type of contract that graduates get once starting their career. Figure 21 shows the percentage of graduates with a temporary contract one year and five years after graduation. The chart on the left hand side suggests that about 15% of food science graduates from UAS have a temporary contract one year after graduation. This percentage is clearly much lower than in the case of ETH graduates (40%). With one of every second graduate being in a temporary position, the percentage among ETH graduates in food science related fields is even higher.

Five years after graduation, the percentage of UAS graduates in food sciences with a temporary contract reduces to less than 5%, but also in case of food science graduates from ETH the incidence shrinks clearly to less than 15%. Five years after graduation the difference between food science graduates from UAS and ETH is thus not statistically significant anymore. However, it is worth mentioning that five years after graduation food science graduates from ETH have a massively lower incidence of temporary contracts that their counterparts in food science related fields.

Figure 21: Graduates with a temporary contract

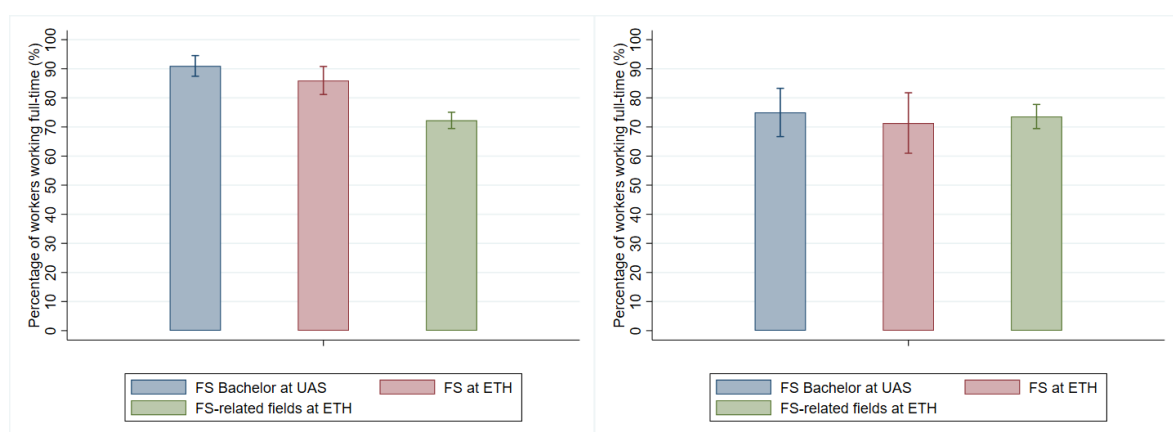


Notes: This figure reports the percentage of graduates with a temporary contract one year (left) and five years (right) after graduation for three different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

### Full-time employment

Another important measure of the working conditions is the percentage of graduates working full-time. Figure 22 reports this measure one and five years after graduation. The chart on the left-hand side suggests that one year after graduation 90% of food science graduates from UAS are working full-time. The percentage of food science graduates from ETH being employed full time is slightly lower, but still clearly larger than those of ETH graduates in food science related fields, which is about 70%. As the chart on the left-hand side shows, the differences are no longer observable five year after graduation. In general, we note that about 70% of graduates, independently of their degree, are working full-time.

Figure 22: Graduates working full-time



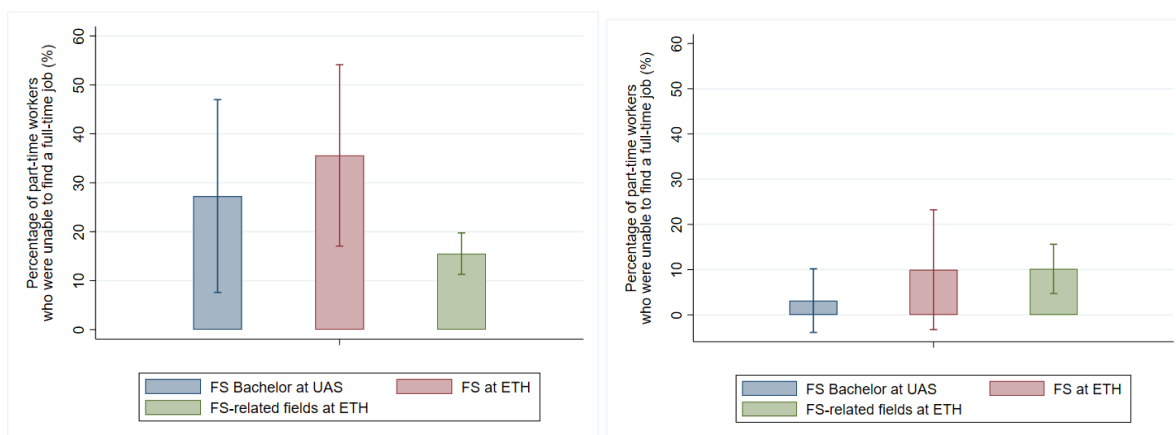
Notes: This figure reports the percentage of graduates working full-time one year (left) and five years (right) after graduation for three different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

### Involuntary part-time employment

Working full-time or part-time is by itself not necessarily an indicator of good or bad working conditions. We therefore refine our analysis by looking at the percentage of graduates working part-time but wishing to work full-time, the so-called involuntary part-time employment. This indicator measures the willingness of graduates to work more if they would have the chance to.

Figure 23 shows the percentage of graduates working involuntary part-time one year and five years after graduation out of the total number graduates working part-time. This figure suggests that compared to UAS graduates, food science graduates from ETH a slightly more likely to be working involuntarily part-time both one year and five years after graduation. These differences are however not statistically different. Five years later, the percentage of graduates working involuntarily part-time drops massively. Still, there are no statistical differences in the incidence of involuntary part-time between UAS and ETH graduates.

Figure 23: Graduates working involuntary part-time



Notes: This figure reports the percentage of graduates working part-time but wishing to work more one year (left) and five years (right) after graduation for three different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

## 7 Conclusion, Open Questions, and Limitations

This report shows that graduates from the food science program at ETH Zurich follow different careers than the graduates from the programs at UASs. It also shows that the labor market outcomes of these two groups differ, with ETH graduates achieving better results in some outcomes, whereas UAS graduates in others. The satisfaction with the study programs is comparable among the graduates. Therefore, overall, there is no clear advantage of one institution over another.

However, graduates from ETH Zurich and from UASs differ in their individual characteristics. Thus, whether the observed differences in employment arise from the selection of graduates into the programs or the study programs itself remains open. In particular, the difference in the gender composition differs substantially between ETH Zurich and UASs. This large difference, whose exact origin we do not know, may however partially explain the differences in other indicators analyzed in this report. This aspect represents an open question which demands further investigation and should be addressed first for adequate action.

Another limitation of this report is the fact that the data provides only limited information of other labor market experiences that graduates might have had before or during their study. Such kind of information might for instance explain the better transition of UAS graduates – higher integration in the labor market and lower incidence of temporary contracts – compared to ETH graduates.

Finally, a further important limitation of our report is that the data allows observing the graduates only one and five years after the end of their studies, and not at a later stage. It is therefore impossible for us to determine whether differences between ETH and UAS graduates will disappear over the course of their careers or whether, on the contrary, indicators for which we do not find statistically significant differences – such as income – will diverge in the long run. This aspect too remains an open question that needs further investigation.

## Appendix

Table 4: Comparison of data pre- and post-reform

	All (2008-2018)		Pre-reform (2008-2012)		Post-reform (2014-2018)			
Variable	Mean	SD	Mean	SD	Mean	SD	Difference	t
<b>Demographics</b>								
Age	27.3	3.6	27.7	3.6	27.2	3.6	-0.5	0.11
Gender	0.3	0.4	0.3	0.4	0.3	0.5	0.0	0.04
Nationality	0.8	0.4	0.9	0.3	0.8	0.4	-0.1	0.16
Prior work experience	0.7	0.5	0.8	0.4	0.7	0.5	-0.1	0.15
Related prior work experience	0.3	0.5	0.3	0.5	0.3	0.5	0.0	0.04
Vocational education and training diploma	0.1	0.2	0.0	0.2	0.1	0.2	0.0	0.18
<b>Satisfaction</b>								
Study program satisfaction: Labor market entry	3.3	1.2	3.5	1.2	3.2	1.2	-0.3	0.19
Study program satisfaction: Further education	3.3	1.2	3.3	1.3	3.4	1.2	0.1	0.05
Study program satisfaction: Current task	3.5	1.1	3.6	1.0	3.4	1.1	-0.2	0.18
Study program satisfaction: Future career	4.0	1.0	4.1	0.9	4.0	1.0	-0.1	0.14
Study program satisfaction: Personal development	4.2	0.8	4.3	0.7	4.2	0.9	-0.1	0.13
Study program satisfaction: Decide master program	4.1	1.0	4.1	1.1	4.1	1.0	0.0	0.00
Redo program at same institute	1.6	1.0	1.7	1.1	1.6	1.0	-0.1	0.07
Match satisfaction: Position	3.9	0.9	3.9	1.0	3.9	0.9	0.0	0.01
Match satisfaction: Task	4.0	0.8	4.0	0.9	3.9	0.8	-0.1	0.13
Match satisfaction: Professional qualification	3.7	1.0	3.6	1.0	3.7	1.0	0.1	0.07
Match satisfaction: Wage	3.4	1.0	3.4	1.0	3.4	1.0	0.0	0.04
Satisfaction employment: Task content	4.0	0.9	4.1	1.0	4.0	0.9	-0.1	0.12
Satisfaction employment: Intellectual and physical stress	3.8	1.0	3.9	1.0	3.7	1.0	-0.2	0.13
Satisfaction employment: Workload	3.5	1.0	3.6	0.9	3.5	1.0	-0.1	0.08
Satisfaction employment: Social status of occupation	3.7	1.0	3.8	1.0	3.7	1.0	-0.1	0.10
Satisfaction employment: Working conditions	4.0	1.0	4.0	1.0	4.0	1.0	0.0	0.02
Satisfaction employment: Career opportunities	3.3	1.2	3.1	1.2	3.3	1.2	0.2	0.15
Satisfaction employment: Occupational qualification	3.8	0.9	3.7	1.1	3.8	0.9	0.1	0.11
Satisfaction employment: Responsibility	3.9	1.0	3.9	1.1	3.9	0.9	0.1	0.06

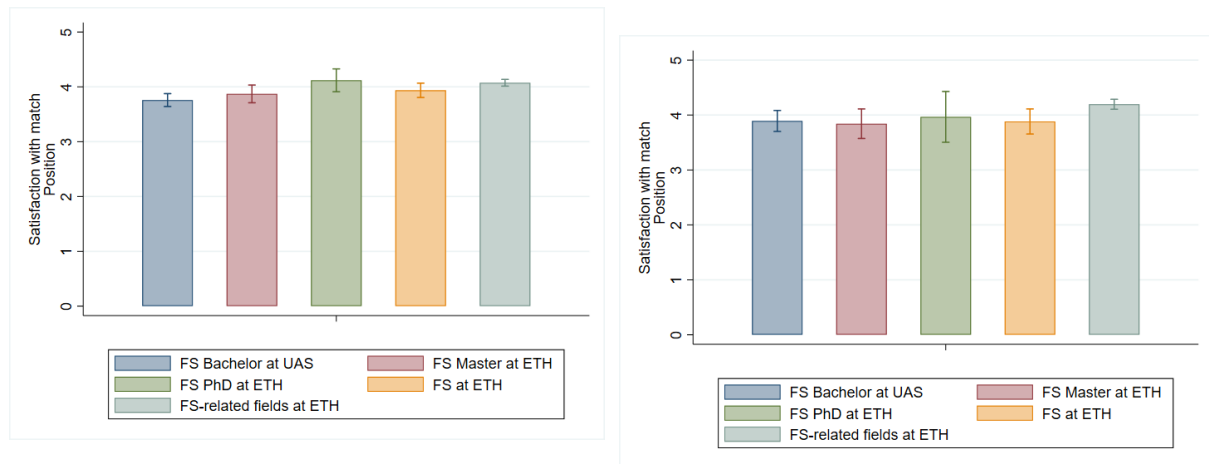
	All (2008-2018)		Pre-reform (2008-2012)		Post-reform (2014-2018)			
Variable	Mean	SD	Mean	SD	Mean	SD	Difference	t
<i>Job profile</i>								
Firm size	0.6	0.5	0.6	0.5	0.7	0.5	0.1	0.22
Working abroad	0.1	0.3	0.1	0.3	0.1	0.4	0.1	0.22
Horizontal skills mismatch	0.3	0.4	0.3	0.5	0.3	0.4	0.0	0.09
Vertical skills mismatch	0.9	0.3	0.9	0.3	0.9	0.3	0.0	0.06
Skills acquired: Know essential methods	5.6	1.1	5.6	1.0	5.6	1.1	-0.1	0.06
Skills acquired: ICT	4.3	1.4	4.4	1.3	4.2	1.5	-0.2	0.10
Skills acquired: Team work	4.7	1.4	4.8	1.4	4.7	1.4	-0.1	0.08
Skills acquired: Apply knowledge to new problems	5.5	1.3	5.5	1.3	5.4	1.3	-0.1	0.06
Skills acquired: Theoretical knowledge	5.9	1.0	5.9	1.1	6.0	1.0	0.1	0.11
Skills acquired: Learn new topic independently	6.1	1.1	6.0	1.2	6.1	1.1	0.1	0.06
Skills acquired: Negotiate effectively	3.4	1.8	3.6	1.8	3.4	1.8	-0.3	0.14
Skills acquired: Interdisciplinary knowledge	5.5	1.3	5.5	1.2	5.5	1.3	0.0	0.01
Skills acquired: Present to an audience	4.8	1.5	5.0	1.5	4.7	1.5	-0.3	0.18
Skills acquired: Goal orientation	5.4	1.3	5.4	1.4	5.4	1.3	0.0	0.01
Skills acquired: Knowledge of economic matters	3.8	1.7	3.9	1.7	3.8	1.8	-0.1	0.04
Skills acquired: Explain complex issues clearly	5.0	1.3	5.0	1.4	5.0	1.3	0.0	0.01
Skills acquired: Communicate own point of view	4.3	1.4	4.3	1.4	4.3	1.4	0.0	0.02
Skills acquired: Communicate successes	3.7	1.7	3.6	1.8	3.8	1.7	0.2	0.09
Skills acquired: Legal foundations	3.1	1.4	3.0	1.5	3.1	1.4	0.1	0.08
Skills acquired: Acting responsibly	5.1	1.5	5.0	1.5	5.2	1.4	0.2	0.11
Skills acquired: Foreign language	5.5	1.5	5.4	1.5	5.5	1.4	0.1	0.04
Skills acquired: Text writing	5.7	1.3	5.7	1.3	5.7	1.3	0.1	0.04
Skills acquired: Approach task analytically	5.9	1.0	5.7	1.1	6.0	1.0	0.2	0.17
Skills acquired: Use time efficiently	5.4	1.4	5.3	1.5	5.5	1.3	0.2	0.10
Skills acquired: Self-critique	5.0	1.5	4.8	1.6	5.0	1.4	0.2	0.10
Skills acquired: Work independently	6.1	1.1	6.0	1.2	6.1	1.0	0.0	0.03
Skills acquired: Take responsibility	5.0	1.6	4.9	1.8	5.0	1.6	0.1	0.04

	All (2008-2018)		Pre-reform (2008-2012)		Post-reform (2014-2018)			
Variable	Mean	SD	Mean	SD	Mean	SD	Difference	t
<i>Job profile (continued)</i>								
Skills used: Know essential methods	4.6	1.7	4.6	1.8	4.5	1.7	0.0	0.02
Skills used: ICT	4.9	1.3	5.0	1.4	4.9	1.3	-0.1	0.03
Skills used: Team work	5.9	1.2	6.1	0.9	5.8	1.3	-0.3	0.29
Skills used: Apply knowledge to new problems	5.9	1.2	6.0	1.2	5.9	1.2	-0.1	0.06
Skills used: Theoretical knowledge	4.9	1.6	4.9	1.7	4.8	1.5	0.0	0.01
Skills used: Learn new topic independently	5.9	1.2	5.8	1.2	6.0	1.2	0.2	0.14
Skills used: Negotiate effectively	4.9	1.6	5.2	1.5	4.7	1.6	-0.5	0.27
Skills used: Interdisciplinary knowledge	5.4	1.4	5.3	1.5	5.4	1.3	0.2	0.09
Skills used: Present to an audience	5.2	1.6	5.5	1.6	5.1	1.6	-0.3	0.17
Skills used: Goal orientation	6.0	1.0	6.2	0.9	6.0	1.1	-0.2	0.18
Skills used: Knowledge of economic matters	4.3	1.8	4.4	1.8	4.2	1.8	-0.2	0.10
Skills used: Explain complex issues clearly	5.6	1.3	5.7	1.3	5.5	1.3	-0.3	0.17
Skills used: Communicate own point of view	4.7	1.6	4.9	1.5	4.6	1.7	-0.3	0.17
Skills used: Communicate successes	5.4	1.3	5.6	1.2	5.3	1.3	-0.3	0.21
Skills used: Legal foundations	4.0	1.8	4.1	1.8	4.0	1.8	-0.1	0.06
Skills used: Acting responsibly	6.1	1.2	6.2	1.0	6.0	1.3	-0.2	0.19
Skills used: Foreign language	5.2	1.7	5.3	1.8	5.2	1.7	-0.1	0.06
Skills used: Text writing	5.5	1.5	5.5	1.6	5.5	1.5	0.0	0.01
Skills used: Approach task analytically	5.7	1.3	5.7	1.4	5.7	1.3	-0.1	0.05
Skills used: Use time efficiently	5.9	1.2	6.1	1.1	5.7	1.2	-0.3	0.25
Skills used: Self-critique	5.3	1.3	5.2	1.5	5.4	1.2	0.2	0.12
Skills used: Work independently	6.4	1.0	6.6	0.7	6.2	1.0	-0.3	0.37
Skills used: Take responsibility	6.1	1.1	6.3	0.9	6.0	1.1	-0.2	0.20
Position: Intern	0.0	0.2	0.0	0.1	0.0	0.2	0.0	0.17
Position: Employee	0.3	0.5	0.3	0.5	0.3	0.5	0.0	0.04
Position: Lower management	0.1	0.3	0.2	0.4	0.1	0.3	-0.1	0.17
Position: Middle management	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.00

	All (2008-2018)		Pre-reform (2008-2012)		Post-reform (2014-2018)			
Variable	Mean	SD	Mean	SD	Mean	SD	Difference	t
<i>Job profile (continued)</i>								
Position: Upper management	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.04
Position: Self-employed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
Further education: None	0.3	0.5	0.3	0.5	0.4	0.5	0.1	0.18
Further education: University degree	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.12
Further education: Continuing education	0.1	0.2	0.1	0.3	0.1	0.2	0.0	0.05
Further education: Outside university	0.0	0.2	0.0	0.2	0.0	0.1	0.0	0.12
<i>Labor Market Success</i>								
Labor market status: Employed	0.4	0.5	0.2	0.4	0.5	0.5	0.3	0.52
Labor market status: Unemployed	0.0	0.1	0.0	0.0	0.0	0.1	0.0	1.50
Labor market status: In education	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.09
Labor market status: Inactive	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.03
Income	78536.7	19346.4	82595.7	18512.1	76521.6	19501.4	-6074.2	0.27
Temporary contract	0.4	0.5	0.4	0.5	0.5	0.5	0.1	0.14
Full-time employment	0.9	0.3	0.8	0.4	0.9	0.3	0.1	0.15
Involuntary part-time employment	0.4	0.5	0.3	0.5	0.4	0.5	0.1	0.14

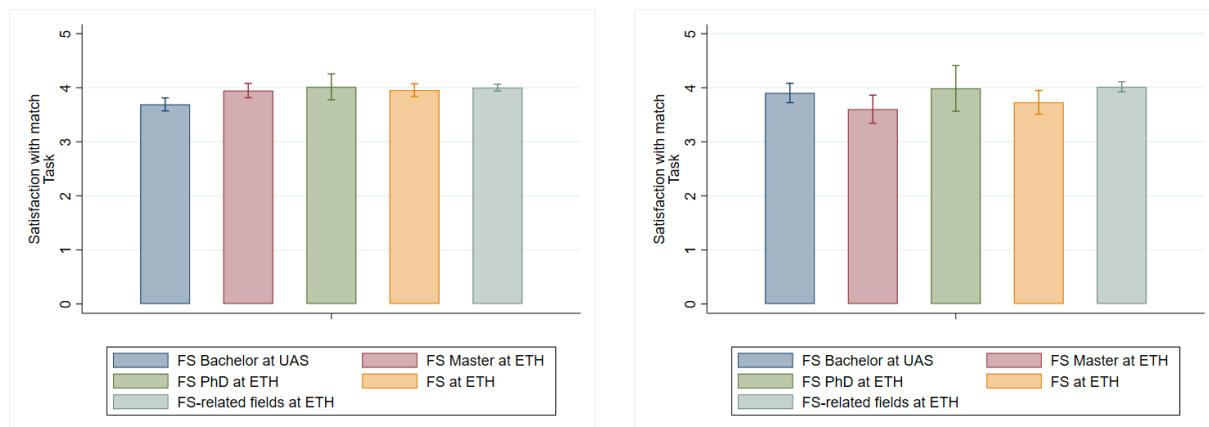
## Figures for satisfaction with match of study program to employment

Figure 24: Graduates' satisfaction with the match of their study program to employment - position



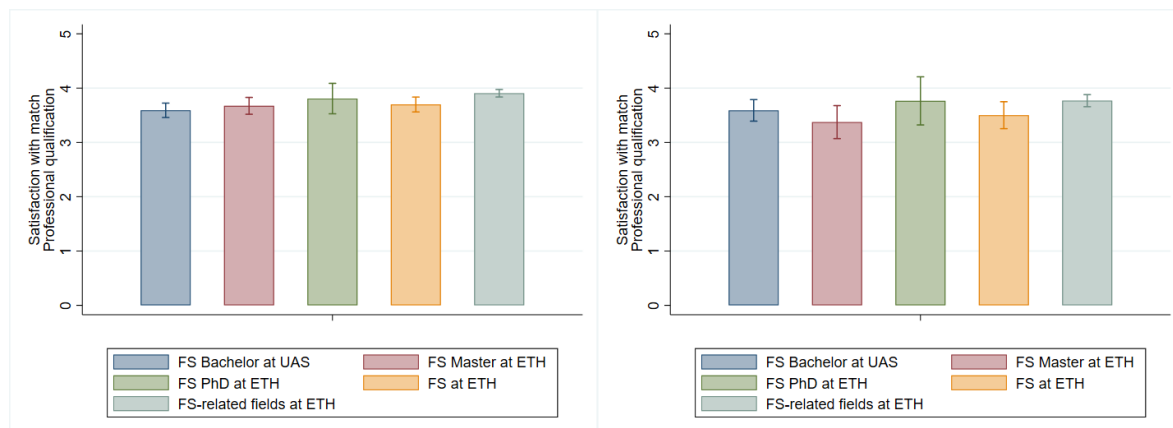
Notes: This figure reports the satisfaction of graduates with the match of their study program to employment concerning their position one year (right) and five years (left) after graduation for five different study programs. FS stands for food science. The study program "ETH graduates in FS-related fields" consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

Figure 25: Graduates' satisfaction with the match of their study program to employment - task



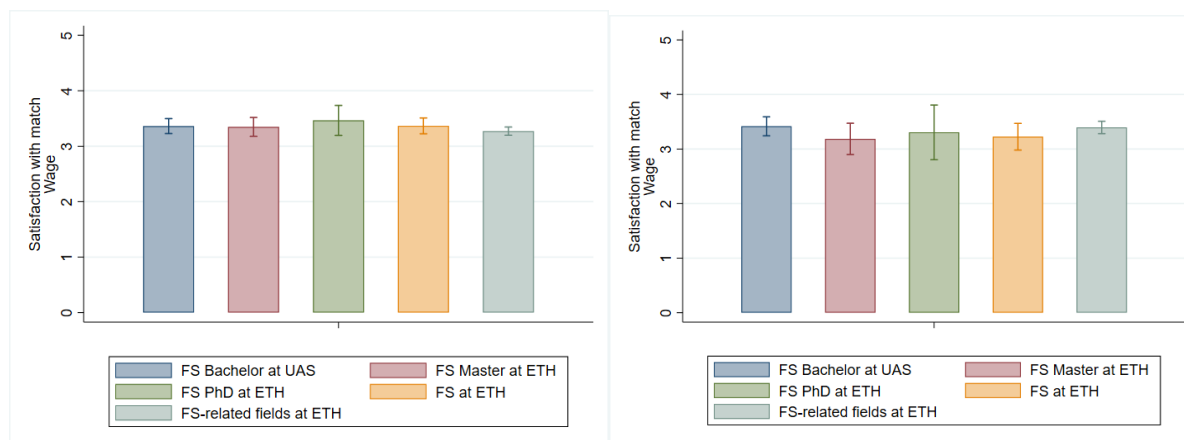
Notes: This figure reports the satisfaction of graduates with the match of their study program to employment concerning their task one year (right) and five years (left) after graduation for five different study programs. FS stands for food science. The study program "ETH graduates in FS-related fields" consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

Figure 26: Graduates' satisfaction with the match of their study program to employment - professional qualification



Notes: This figure reports the satisfaction of graduates with the match of their study program to employment concerning their professional qualification one year (right) and five years (left) after graduation for five different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

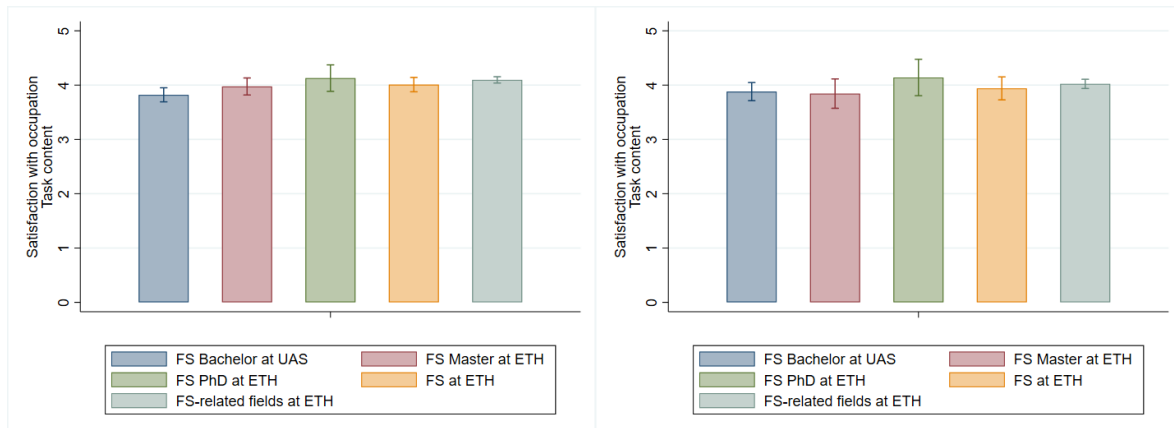
Figure 27: Graduates' satisfaction with the match of their study program to employment - wage



Notes: This figure reports the satisfaction of graduates with the match of their study program to employment concerning their wage one year (right) and five years (left) after graduation for five different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

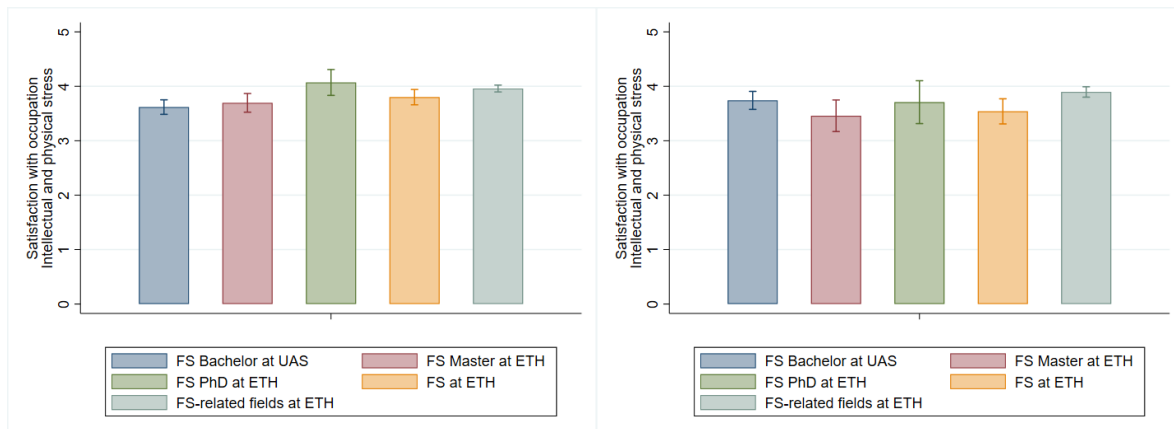
## Figures for satisfaction with current employment

Figure 28: Graduates' satisfaction with their current employment - task content



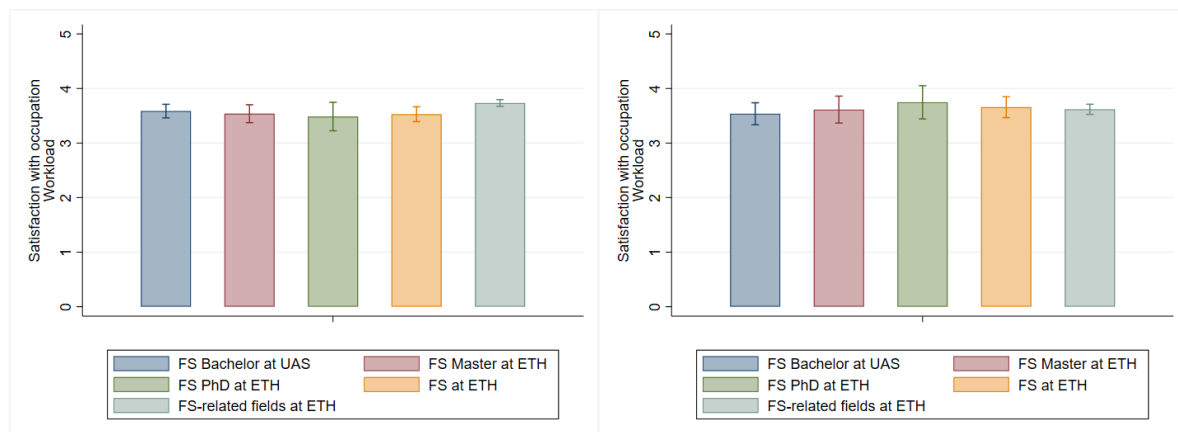
Notes: This figure reports the satisfaction of graduates with their current employment concerning the task content one year (right) and five years (left) after graduation for five different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

Figure 29: Graduates' satisfaction with their current employment - intellectual and physical stress



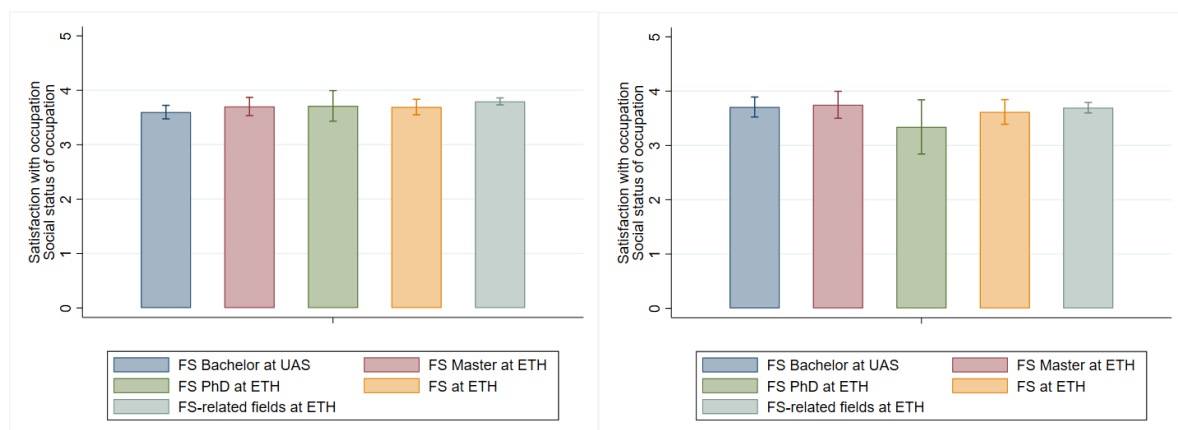
Notes: This figure reports the satisfaction of graduates with their current employment concerning the intellectual and physical stress one year (right) and five years (left) after graduation for five different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

Figure 30: Graduates' satisfaction with their current employment - workload



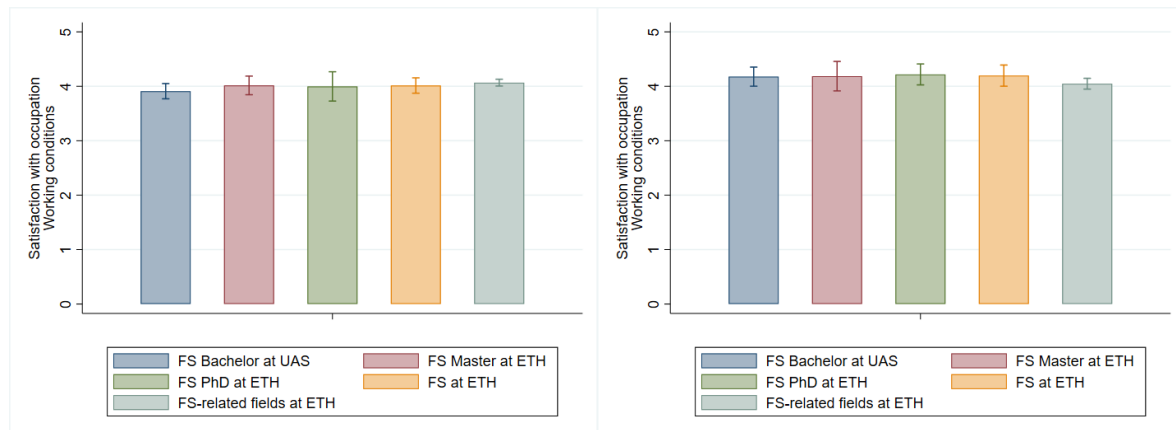
Notes: This figure reports the satisfaction of graduates with their current employment concerning the workload one year (right) and five years (left) after graduation for five different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

Figure 31: Graduates' satisfaction with their current employment - social status of their occupation



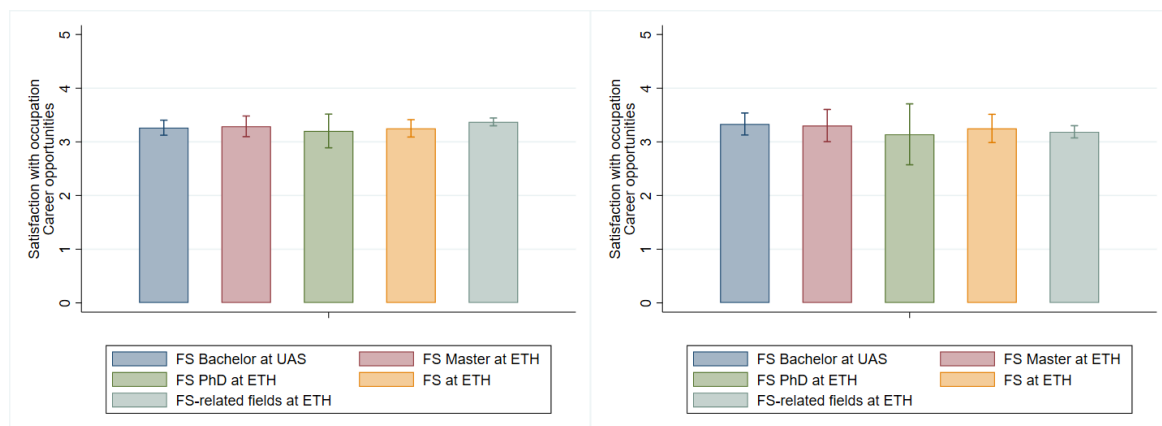
Notes: This figure reports the satisfaction of graduates with their current employment concerning the social status of their occupation one year (right) and five years (left) after graduation for five different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

Figure 32: Graduates' satisfaction with their current employment - working conditions



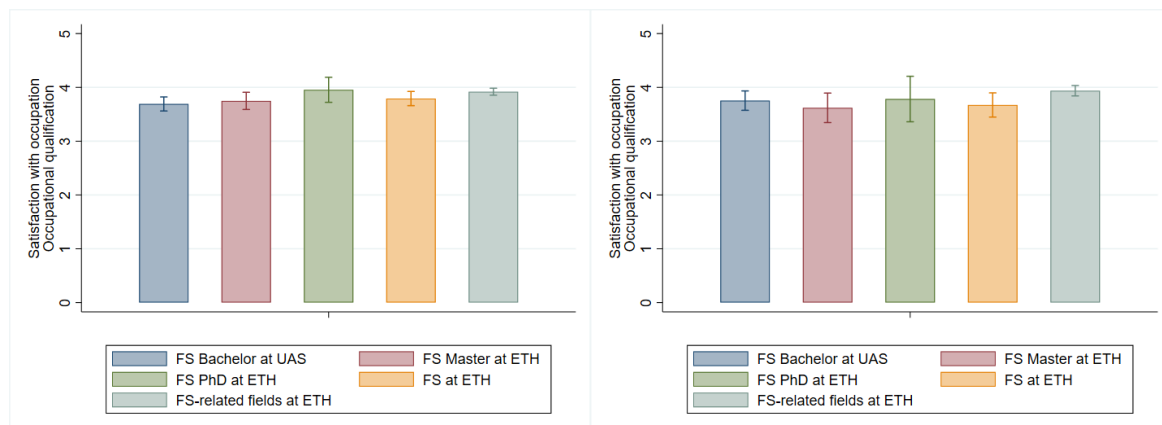
Notes: This figure reports the satisfaction of graduates with their current employment concerning the working conditions one year (right) and five years (left) after graduation for five different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

Figure 33: Graduates' satisfaction with their current employment - career opportunities



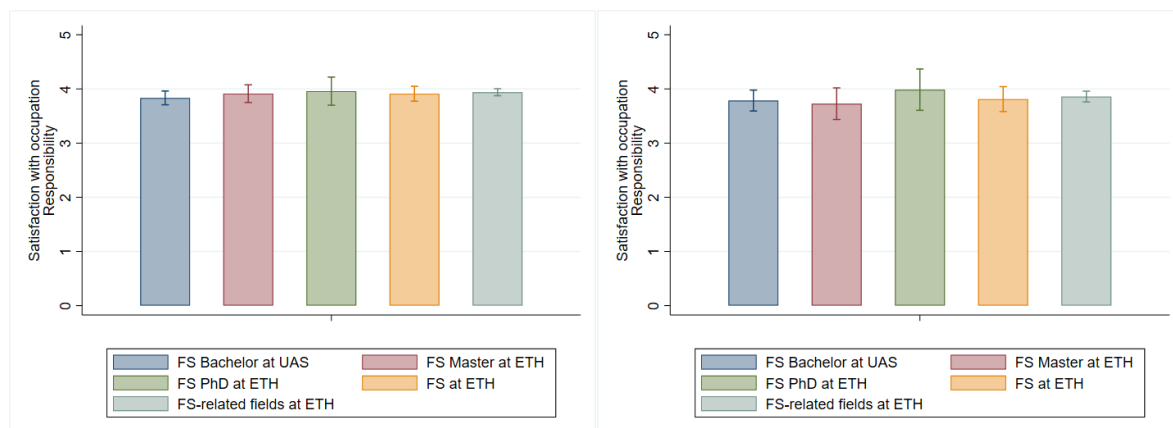
Notes: This figure reports the satisfaction of graduates with their current employment concerning the career opportunities one year (right) and five years (left) after graduation for five different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

Figure 34: Graduates' satisfaction with their current employment - occupation qualification



Notes: This figure reports the satisfaction of graduates with their current employment concerning the occupation qualification one year (right) and five years (left) after graduation for five different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

Figure 35: Graduates' satisfaction with their current employment - responsibility



Notes: This figure reports the satisfaction of graduates with their current employment concerning the responsibility one year (right) and five years (left) after graduation for five different study programs. FS stands for food science. The study program “ETH graduates in FS-related fields” consist of the study programs agricultural science, chemical engineering, biology, and pharmaceutical science. The confidence interval around the average value shows the precision of the mean.

## Citations

ILO (2013). Global Employment Trends for Youth 2013. A generation at risk. Technical report, International Labour Office Geneva.

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