THE COMPREHENSION AND STUDY OF THE CONCEPTUAL SIGNIFICANCE OF 'SUSTAINABILITY' IN AGRICULTURE AND FOOD PRODUCTION AT UNIVERSITY LEVEL

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Abstract

University courses in sustainable development should meet the overall education requirements of the 21st century, thus allowing students to make use of their skills towards the long-term development of life on earth. The level of comprehension about the 'sustainability' concept underwent evaluation, as the main objective of the research, as well as student propensity towards a master programme in this field. The study relies on the surveys conducted on 392 students belonging to the four faculties within the University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania, during September 2015, followed by descriptive statistical analysis of the data. A significant variation was revealed in the level of comprehension for the two related concepts under survey, 'sustainability' and 'sustainable food consumption' in the case of students enrolled in different study programmes. In addition, a high correlation is depicted, between the level of comprehension of the two concepts ($r=0.798$, $p<0.001$). Half of the respondents claim they have a certain level of knowledge about 'sustainability' and 'sustainable food consumption'. Furthermore, only 33% of respondents asserted that the courses in the field had helped them in their comprehension of the concepts, while 29% denied the usefulness of the courses in providing them with knowledge on sustainability and related concepts. Students exhibit a medium level of interest for a master's course in the field, dependent on different coordinates, such as scholarships, collaboration with foreign universities and financial matters, to mention a few. Therefore, universities should actively engage in promoting 'sustainability' as paramount in the study and practice of agriculture and food production, as the study reveals a low level of knowledge and lack of awareness about the overall significance of the concept of 'sustainability.

Key words: *sustainable development, student perception, understanding, education, master programme*

1. INTRODUCTION

The importance of Sustainable Development Education has been acknowledged internationally by adopting the Declaration of the United Nations - Decade on Education for Sustainable Development (UNDESD) 2005-2014, which aims to integrate sustainable development principles, values and practices into all educational activities in order to determine behavioural changes that will, in turn, produce an economically, socially and environmentally sustainable future for both, present and future generations (UNESCO, 2005).

The importance assigned to the perception and comprehension of the sustainability concept among younger generations is a topic of great relevance in the field of scientific research worldwide. However, Fumiyo (2007) believes that students' perceptions of sustainable development and other associated concepts are generally insufficiently explored. Thus, studies conducted by Fumiyo (2007) among students show that sustainability is perceived as a "positive thing", being more predominantly associated with environmental rather than economic and social elements. The results of the same study show that the most important elements associated with a sustainable lifestyle include: changing consumer behaviour, recycling, as well as saving water and energy (Fumiyo, 2007).

The connection between the perception of the main dimensions of sustainable development and changing lifestyle among students was also analysed by Tuncer (2008), highlighting the important role

that universities play in educating young people towards sustainable behaviour. Felgendreher and Löfgren (2017) analyse how sustainable education at university level influences students' attitudes, values and norms, namely how binding educational activities affect their moral and ethical perceptions. Their conclusions show that there is an influence of educational actions on students' sustainable behaviour but this is not even, as it is influenced by their individual characteristics (Felgendreher and Löfgren, 2017).

Eagle *et al.* (2015) consider that students' concerns about personal involvement in sustainability provisions are modest, as they reckon that responsibility for problem resolution lies with others. This attitude is associated with the reluctance of young people under survey to consider major changes in their own lifestyle.

Other literature studies on student perceptions about sustainability are focused on specific areas. As such, Xu and Vera (2014) identify the main attributes that significantly affect student comprehension of sustainability in agriculture. Furthermore, they assesses the impact of a study program developed in this area on student perceptions of sustainability. The authors of the study reveal a change in attitude amongst students, considering that future farmers should produce and provide consumers with healthy food - thus achieving a positive social externality of farming, maintaining the quality of water and thus protecting the environment, while at the same time obtaining a stable income to ensure economic sustainability (Xu and Vera, 2014).

Student knowledge of the concept of sustainability and its applicability in tourism was studied by Camargo and Gretzel (2017), the results of which show, on the one hand, the existence of a positive perception on the importance of sustainability and, on the other hand, limited knowledge of its principles and its manner of application in tourism.

Watson *et al.* (2013) and Gannon *et al.* (2017) assesses how the curriculum in engineering sciences contributes to the knowledge and application of sustainability principles. The results obtained by Watson *et al.* (2013) indicate that, sustainable development courses are mostly based on environmental issues, showing a pressing need for an extension of content to the other pillars of sustainability. The same authors emphasize that decision-makers in the university system should provide students with the opportunity to reflect on the concept of sustainability, to educate them in a more holistic way, and to help them integrate the principles of sustainability into their professional lives (Watson *et al.*, 2013). Micangeli *et al.* (2014) describe the "listen-to-apprise" method designed to improve the involvement of all stakeholders in the sustainable development education process. The method put forth is based primarily on listening and collecting information from students, followed by the improvement of their ability to manage practical issues related to sustainability in their field. Sustainable Development Education (SDE) is analyzed by Cebrián and Junyent (2015) in terms of teacher prioritization of practical knowledge and skills needed to develop sustainable behavior.

Primarily considering universities' overall interest in promoting sustainability, Nejati and Nejati (2013) investigate students' perceptions of key factors contributing to the development of "sustainable universities", as their results outline the traits of these types of universities, combining academic excellence with care for human values, promoting sustainable practices in teaching and research and implementing an efficient waste management, energy consumption and land use system.

The present paper resides in the idea of developing a master's programme in the field of sustainable agri-food system by the University of Agricultural Sciences and Veterinary Medicine (USAMV) in Cluj Napoca, Romania, in partnership with other European universities. This endeavour led the initiators of the study program to carry out several preliminary actions, such as conducting research activities. The goal was to investigate graduate students knowledge and self-assessment of their own comprehension level on sustainability and sustainable food consumption concepts. Additionally, the research has tackled how students perceive the possibility of enrolling in an international master, focusing on agri-food sustainability, as well as identifying their expectations towards a study program of this sort.

2. MATERIAL AND METHODS

In order for the research objectives to be achieved, an opinion survey was carried out, which relied on the application of face-to-face questionnaires to a number of 392 students from the University of Agricultural Sciences and Veterinary Medicine of Cluj Napoca (USAMV), representing 76% of the total population of students in the final years, undergraduate level, belonging to the following faculties: Faculty of Agriculture, Faculty of Horticulture, Faculty of Animal Husbandry and Faculty of Food Science and Technology.

The questionnaires were applied in autumn 2015, with the completion of a questionnaire taking approximately 5 minutes. This research tool can be divided into three parts: the first containing questions about student lifestyles and eating habits, the second containing questions of perception about the concept of sustainability and the enrolment in a master's program on the sustainable agri-food system, and the third containing socio-demographic questions (age, gender, residence).

This paper relies on the result analysis for the answers to the questions in the second part of the questionnaire and to the socio-demographic questions. Thus, the main aspects of the analysis were: the perception on the concepts of "sustainability" and "sustainable food consumption"; self-assessment of the level of understanding for these two concepts; appraisal of how the curriculum of the specialization/faculty they belong to has helped during the four years of bachelor studies to understand the two concepts; identification of encouraging / discouraging elements to join an international sustainable agriculture and food system master; identification of the main subjects to be studied during a master in this field; assessment of the likelihood to attend such a master's course; identification of the main issues that would prevent them from joining such a master. Descriptive statistics and Pearson correlation coefficient were used for data analysis.

3. RESULTS AND DISCUSSION

The concept of sustainability is associated by the students under survey with the following: "sustainable development" (22%), "support" (8%) or "environmental protection" (7%), while one third of respondents cannot provide an answer in this regard (fig. 1).

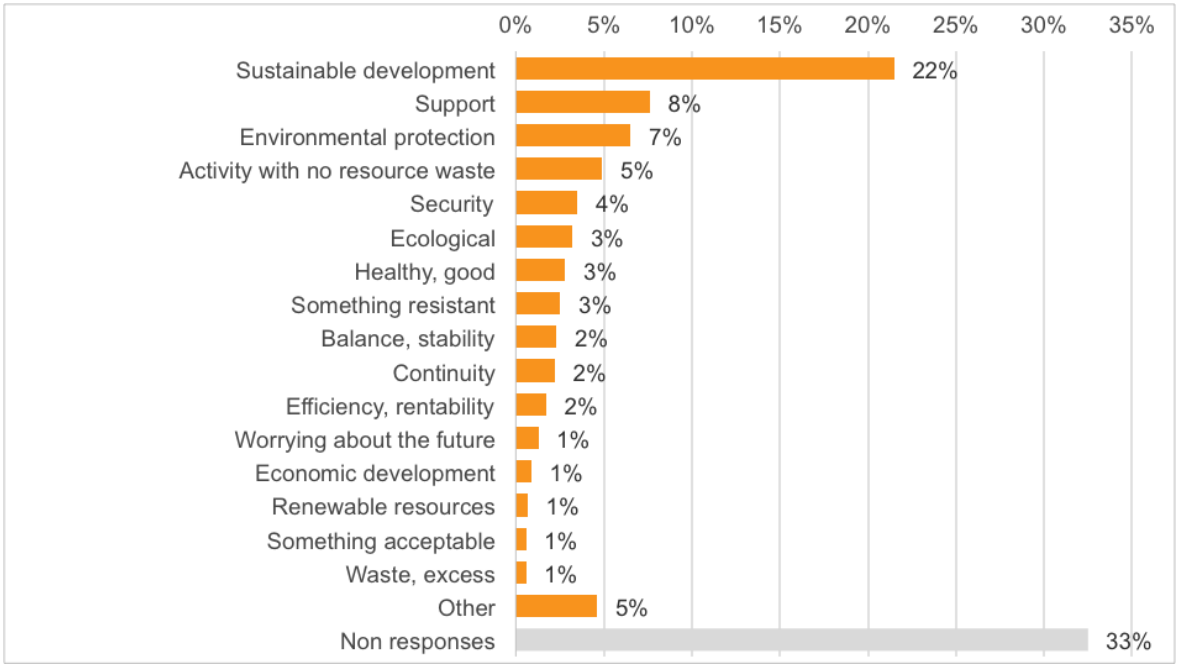


Fig. 1. Answers to the question: What do you first think about when you hear the word 'sustainability'? (open question)

As demonstrated by Zeegers and Clark (2014) and Fumiyo (2007), students' vision of sustainability is significantly focused on environmental issues. It is also the case of the present study where such elements as environmental protection, ecology and renewable resources are considered to be paramount. Regarding the self-assessment of knowledge about the concept of "sustainability", the results show that respondents can be placed on a scale from 0 to 10 especially in the lower categories (0-5). However, the sample average is 4.55, 0.45 points below the scale average (fig. 2).

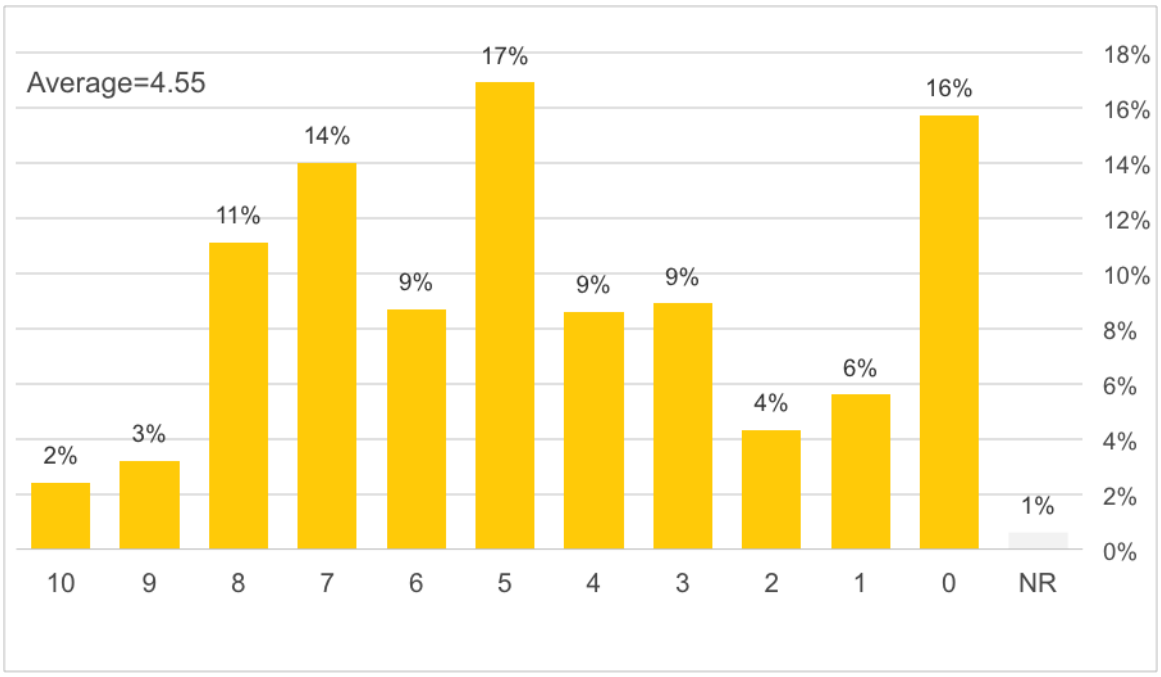


Fig. 2. Self-assessment of the personal level of comprehension for the concept of 'sustainability'

Males believe they understand more about sustainability than females. Such differences in gender were also reported by Tuncer (2008). Additionally, students of the Faculty of Food Science and Technology believe that they know less about sustainability than their colleagues from other faculties (fig. 3).

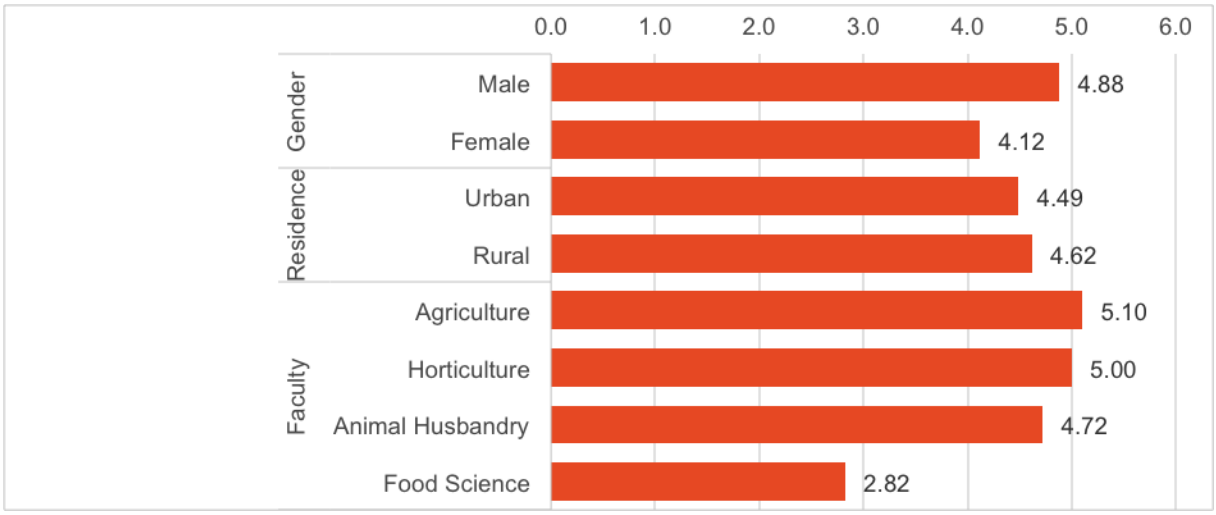


Fig. 3. Average self-assessment score for knowledge on the concept of 'sustainability'

"Sustainable food consumption" is perceived by students especially as a form of "balanced diet, without waste" (17%), but also as a "healthy, beneficial diet" (11%) (fig. 4).

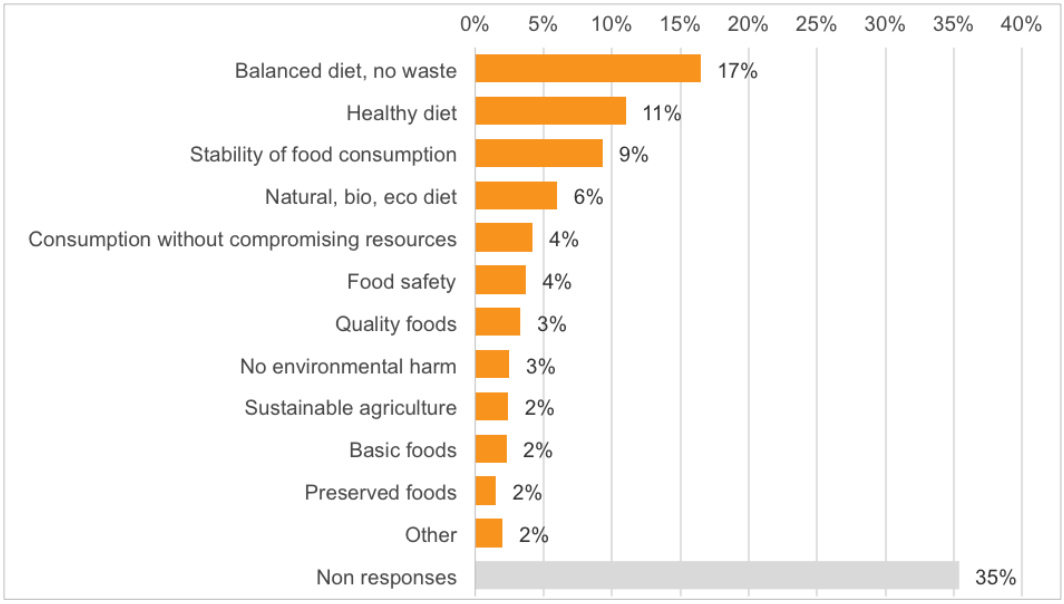


Fig. 4. Answers to the questions: What do you first think about when you hear the phrase 'sustainable food consumption'? (open question)

It would be interesting for future research to investigate whether students of USAMV Cluj have a sustainable consumption behaviour, based on a healthy lifestyle, which is not only perceptual but also applicative, in everyday life. Godfrey *et al.* (2017) point out in this respect that, often, students' ability and willingness to choose healthy foods is hampered by time constraints or the propensity towards another type of "comfort".

Self-assessment of the understanding of the term "sustainable food consumption" on a scale from 0 to 10 shows a relatively similar distribution to the previous one and an average of 4.37 (fig. 5).

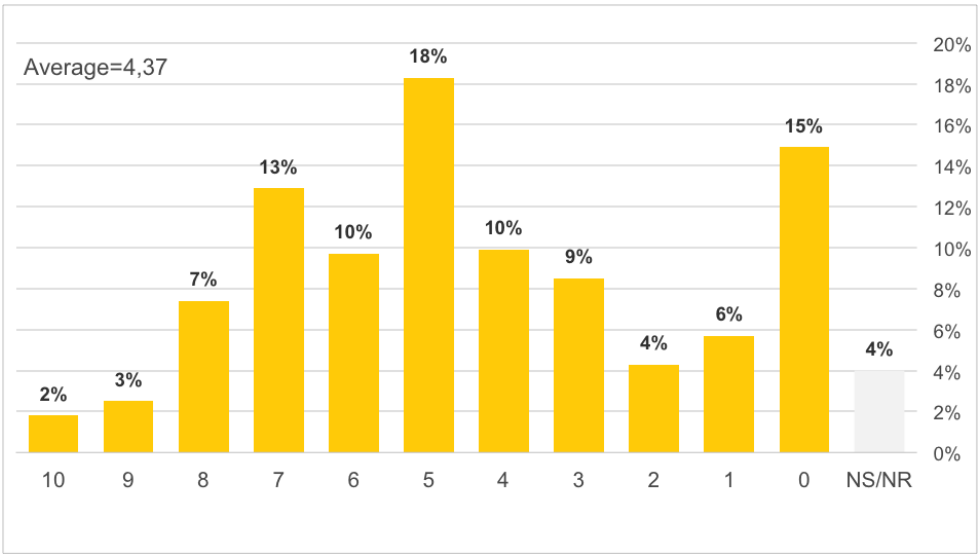


Fig. 5. Self-assessment of the personal level of understanding for the concept of 'sustainable food consumption'

The same differences are identified in the self-assessment of the students' personal level of comprehension for the concept of "sustainable food consumption" as in the case of the concept of "sustainability". Male students and those of the Faculties of Agriculture, Horticulture and Animal Husbandry say they are more familiar with this concept than the students and future graduates of the Faculty of Food Science and Technology (fig. 6).

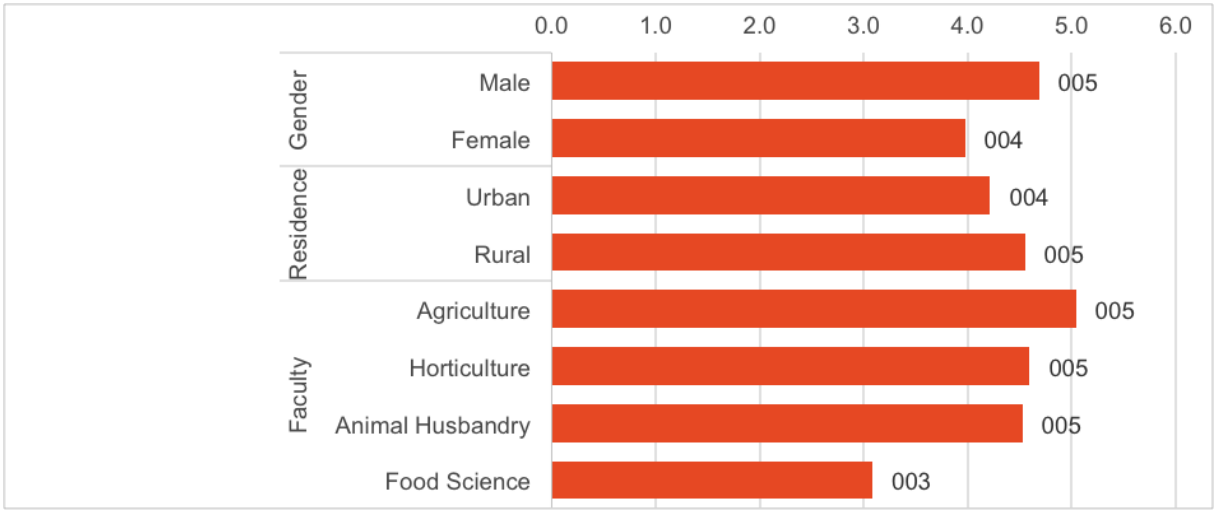


Fig. 6. Average self-assessment score for knowledge on the concept of 'sustainable food consumption'

The correlation between the level of comprehension for the concept of sustainability and the comprehension of the phrase "sustainable food consumption" is high (R Pearson = 0.798, p <0.001).

Regarding the way their specialized/faculty curriculum assists these students in understanding the concept of "sustainability", the opinions are divided: 29% of them say that little is being offered, 37% are placed in the median category of the scale and 33% assess that the aid offered by the university is a major one (fig. 7).

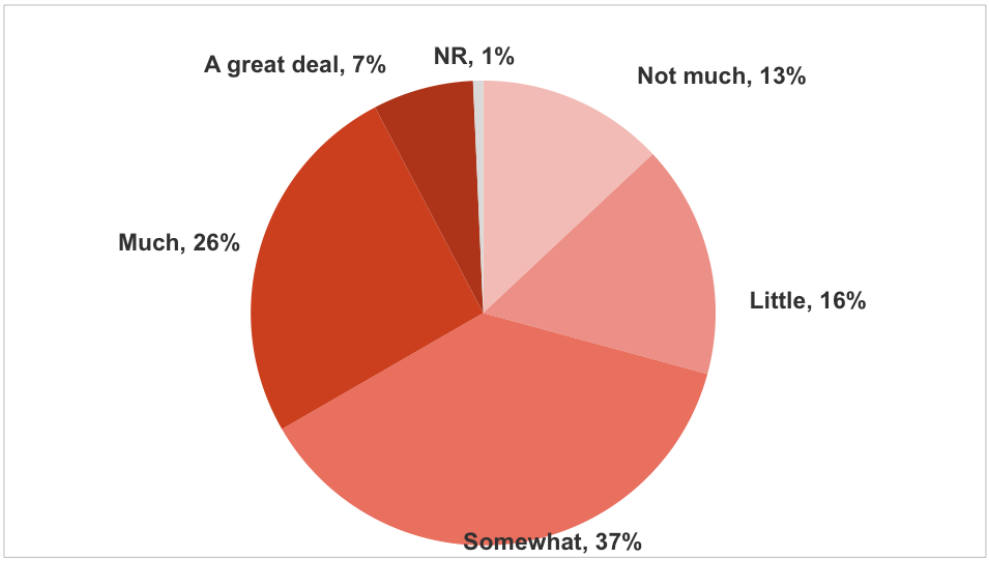


Fig. 7. Answers to the question: How much does your undergraduate studies curriculum help in understanding the concept of 'sustainability'?

Clearly, the placement in one of the categories above is associated with the average score on the self-assessment of knowledge about the concept of "sustainability" (fig. 8).

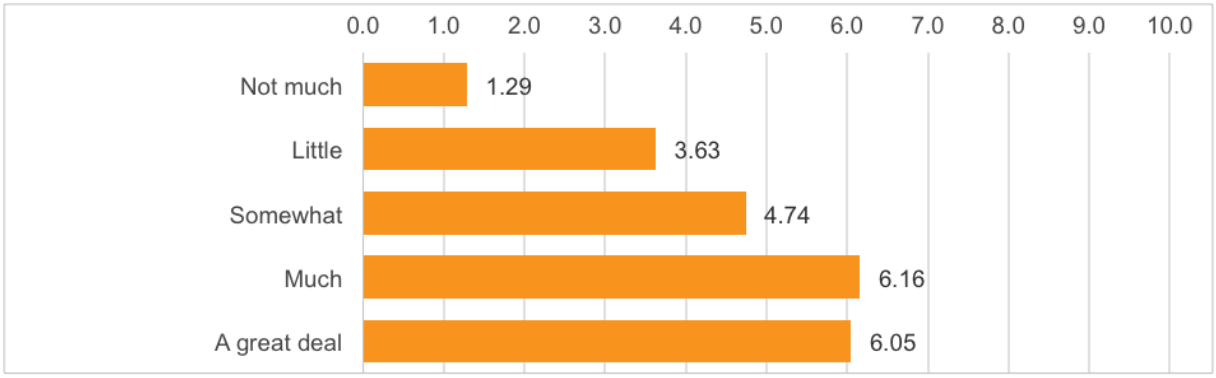


Fig. 8. The average self-assessment score for the level of comprehension on the concept of sustainability against the assessment of the aid provided by the university towards the better understanding of this concept

Solely 18% of the future graduates of the four USAMV faculties involved in this study are very or highly interested in pursuing a master in sustainable agri-food systems. 38% of the investigated subjects express an average desire, and 44% are little, very little or not interested at all in such a master.

The importance granted to the environmental aspects involved in the production process of consumer goods, as well as more significant concerns about environmental hazards are positively associated with the increasing desire for higher qualification in agri-food sustainability. Furthermore, girls, students of the Agriculture and Horticulture faculties, as well as those from the rural environment are the ones more willing to enrol in such a master's programme (fig. 9).

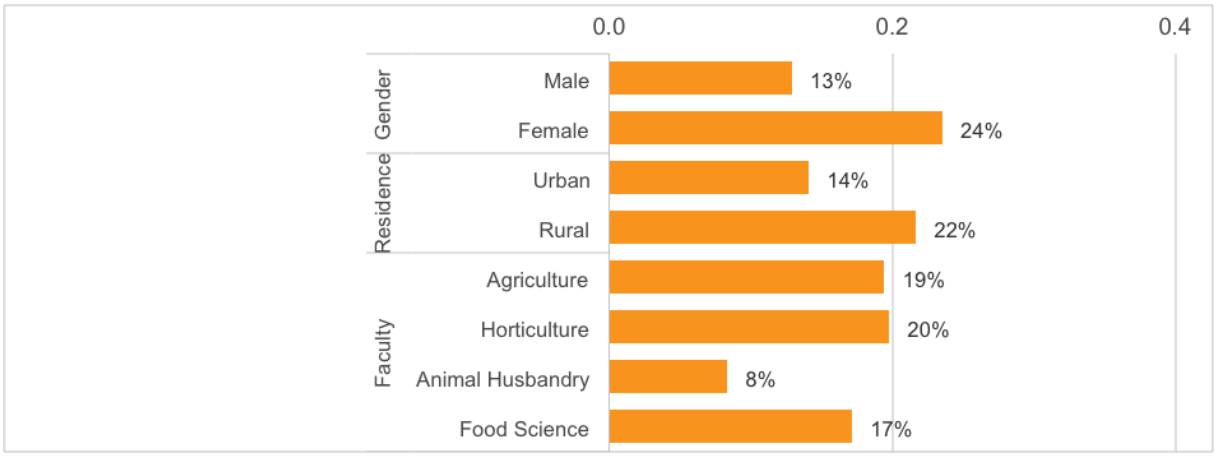


Fig. 9. Share of students that are very or highly interested in enrolling in a master's programme on 'agri-food sustainability'

The existence of scholarships, the openness to the European academic space (the possibility of a practical internship abroad, as well as collaboration with other European universities) are factors that would encourage enrolment in such a master. However, courses taught in English would be a daunting obstacle (fig. 10).

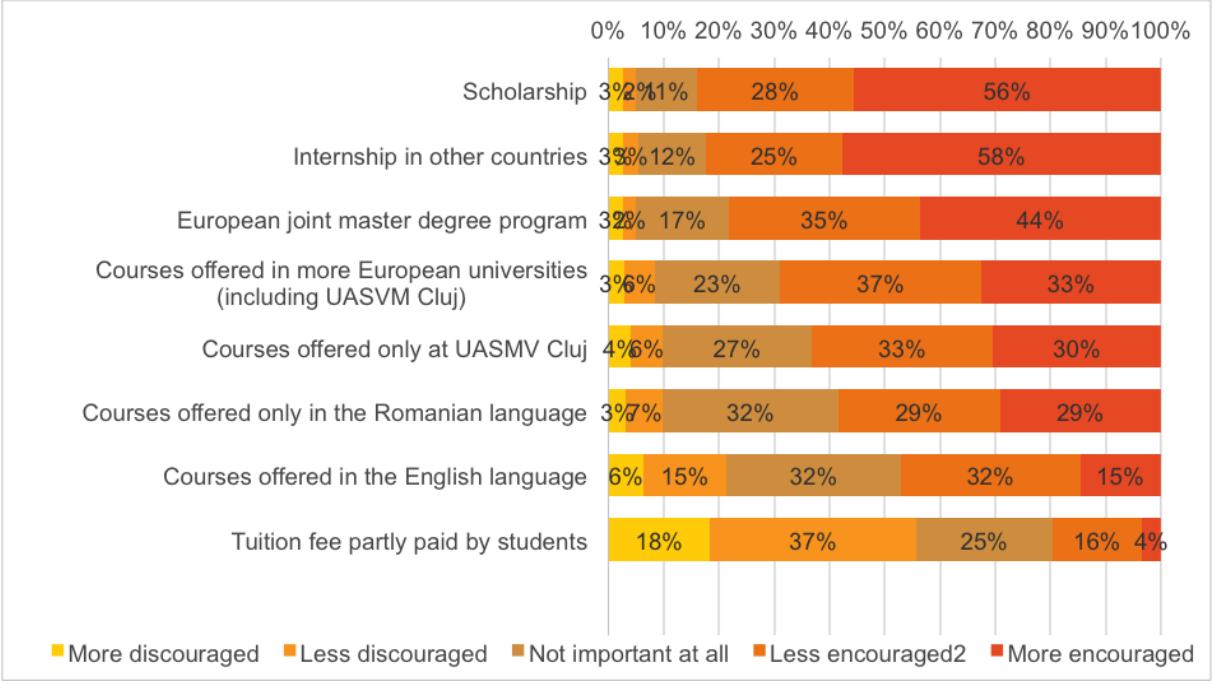


Fig. 10. Encouraging/discouraging aspects regarding the application for a master's programme in 'agri-food sustainability'

The results highlight the important role of universities in the linguistic preparation of students. Internationalization is an objective that must be part of the development strategy of any higher education institution, as the use of the main international languages as teaching and learning languages has become increasingly emphasized throughout the world. Dearden (2014) exemplifies the situation at European level, where, following the Bologna process, courses taught in English attract more and more international students.

Given that 57% of students surveyed in this study do not provide an answer as to what they would like to study during a master's programme in agri-food sustainability (clearly, in relation to the low share of students who want to follow such a master), we are dealing with a variety of study directions indicated by the students. Those who provide a response, however, mention the following main areas of study: processing, food production, organic food, bases of food sustainability (fig. 11).

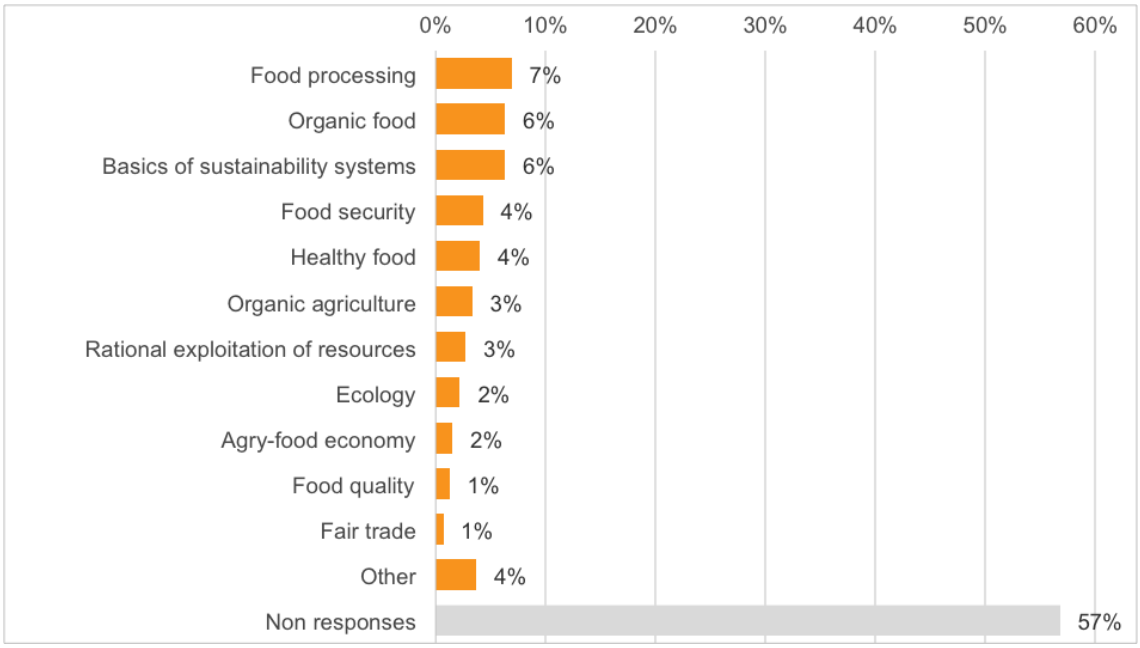


Fig. 11. Answers to the question: What would you mainly want to study during a master's programme on 'food sustainability'? (open question)

Only 13% of USAMV's future graduates state they are almost certain or are likely to pursue a future master's programme in "agri-food sustainability". Another 39% of respondents are not decided, and 47% provide a small chance of such a possibility. By associating the two factors, the desire to pursue a master's programme and the probability, we observe that only 8% of students express their desire and the opportunity to follow it at the same time.

The main issues that may arise during or after the graduation of an international master's degree in "agri-food sustainability" are: the possibility of finding a job (46% of the respondents) and too high tuition costs (30%).

4. CONCLUSIONS

The concepts of "sustainability" and "sustainable food consumption" still pose challenges for most students, while the role of the university in supporting knowledge on these notions and their promotion as principles is a major one. Given that young generations have an enormous responsibility for resource conservation so that "they meet their current needs without compromising the ability of the next generations to meet their own needs" (Brundtland Commission, 1987), it is necessary for all educational, political, economic, social stakeholders involved in educating these young people to make a joint effort and participate actively in all aspects of sustainable development.

Moreover, life-science students must be role models for society, both in terms of sustainable behaviour and the promotion of agri-food production systems that respond to the three fundamental criteria of sustainability: economic, social and environmental. As Zeegers and Clark (2014) said, we cannot afford to ignore any of the three pillars.

Enrolling in a sustainable agri-food system master programme is thus viewed with an average interest, while the lack of vision for professional prospects after graduation is a major impediment and hinders any enthusiasm associated with such an approach. For this reason, there is a need for a permanent connection between the university and the economic community in order to identify those models of good practices across the agri-food chain that broaden students' horizons, enable them to actively engage in these activities and determine to be more aware of the importance of knowing the principles of sustainability and their application in their future career.

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