Consumer acceptance of aquaponics products

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Abstract

The aim of the study was to estimate the consumers‘ awareness of aquaponics and acceptance of aquaponics products in different European regions. The on-line questionnaire was prepared in 5 different European languages and sent to the general public through the aquaponics network of COST FA1305 Action. In total 635 answers were valid for the statistical analysis. On average the attitudes towards aquaponics were positive, showing no significant difference between those who already knew about aquaponics and those who only heard about it through the survey. The consumers are in majority willing to pay more for the products which are produced locally and pesticides/herbicides and antibiotics free in comparison to products from conventional farming. Not more than 23% of participants are willing to pay more for the aquaponically produced products and not more than 40 percent of the price when comparing with the price of products from conventional farming.

Introduction

Aquaponics – combining recirculation aquaculture system (RAS) and hydroponics in a circular food production system is developing throughout the world (Somerville et al., 2014).

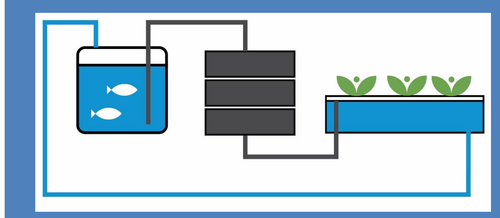


Figure 1: Aquaponics cycle (Leskovec, 2013)

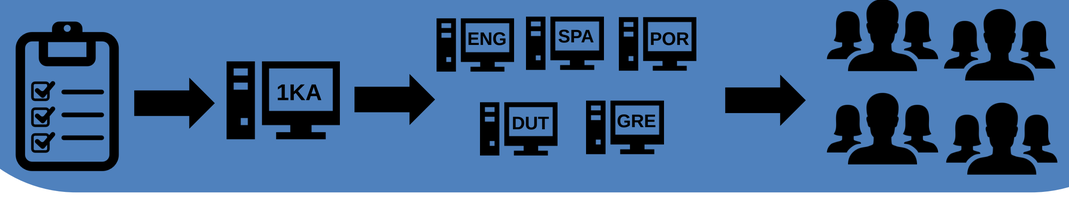
Figure 2: Commercial aquaponics system in Slovenia (Tement, 2015; Phyle, 2015)

In Europe many startup companies are taking the first steps towards commercial production (Thorarinsdottir, 2015), however the European standards are not available for the integrated production system (Goddek et al., 2015) and aquaponics products still can not be certified organic, whereas according to the European Commission Regulation (EC) No 889/2008 organic plant production is based on nourishing the plants primarily through the soil ecosystem and therefore hydroponic cultivation is not allowed. Consumer acceptance and certification criteria are of special interest for the development of commercial scale systems. Limited knowledge is available on consumers‘ acceptance towards aquaponics products with only one study published (Tamin et al., 2015), therefore this study is focusing on the consumers‘ awareness and knowledge about aquaponics in different European countries.

Materials and methods

A web survey with 10 questions was distributed on the internet from February 20th until Aug 31st 2016. The online questionnaire was published using open source application OneClickSURVEY (1KA) for online surveys (University of Ljubljana, Faculty of Social Sciences, Centre for Social Informatics, 2016) in 5 European languages (English, Dutch, Greek, Spanish and Portuguese) and it was distributed to the general public through the aquaponics network within the COST (European Cooperation in Science and Technology) Action FA1305 ‘EU Aquaponics Hub: Realizing Sustainable Integrated Fish and Vegetable Production for the EU‘.

The answers were analyzed using Microsoft Office Excel 2010 and R ver. 3.3.1 for descriptive stastical analysis and for the comparison between different variables.



Results and discussion

1. Demographics

Until the end of August 2016 we have received 2,338 answers, of which 635 were valid for further statistical analysis. The replies received are mainly from Belgium (41.3 %), Greece (9.4%), Iceland (9.1 %), Slovenia (3.8 %) and Netherlands (3.5 %). Other countries with less than 5 % answers are: Portugal, Italy, Norway, Germany, Sweden, Cyprus, Canada, Spain, Switzerland, UK, Denmark and Poland. The answers are representing all age groups from 20 years old and the gender balance is 50.8 % females and 49.2 % males. The participants are mostly employed (64.5 %), self-employed (15.3 %) or students (8.5 %). Most participants claim they are in charge, either by themselves (44.5 %) or in cooperation with their partner 36.7 % for the weekly purchase of food in the household. Most of the respondents earn between 1,000 and 3,000 EUR a month (57.5 %).

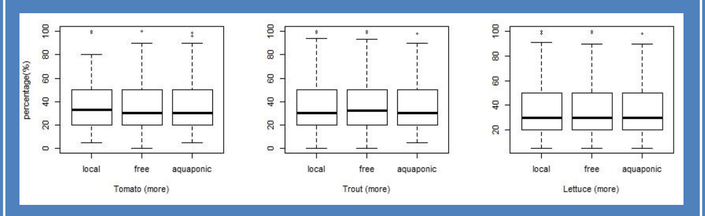
2. The consumers‘ awerness about aquaponics

More than 50% of respondents have never heard of aquaponics, whilst more than 70 % have heard of hydroponics. This is mainly due to the fact that hydroponics is well established production practice with a long tradition since its beginnings date back to the year 1860. Only 5.5 % of respondents are somehow involved in aquaponics. After reading the description of aquaponics the participants answered a set of questions about their attitude towards aquaponics products. On average the attitudes towards aquaponics were positive, showing no significant difference between those who already knew about aquaponics and those who only heard about it through the survey.

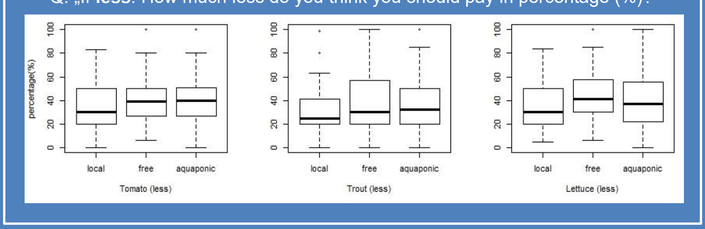
3. The consumers‘ decision factors and willingness to pay when buying food

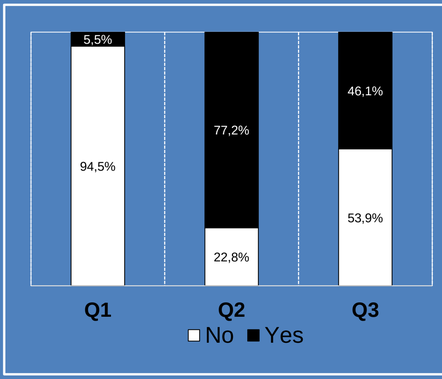
More than 45 % participants look for pesticides and herbicides free produce when buying food. Almost 60 % decide for non-organic produce if the price of organic produce is twice the price of non-organic produce, which confirms the fact that price is still the most important decision factor when buying food. But on the other hand the participants are sensitive to locality and they decide to buy locally produced food, even if it is more expensive. Not more than 23 % participants are willing to pay more for aquaponically produced food in comparison to food from conventional farming. When buying food, the participants are more sensitive to local and pesticides/herbicides and antiobiotics free products. More than 38 % participants are willing to pay more for the products produced locally and more than 51 % for pesticides/herbicides and antibiotics free products. This means that aquaponics by itself (not produced locally and not emphasized as pesticides and herbicides or antibiotics free) is regarded as less attractive than the other two production practices.

Q: „If **more**: How much more would you be willing to pay in percentage (%)?“



Q: „If **less**: How much less do you think you should pay in percentage (%)?“

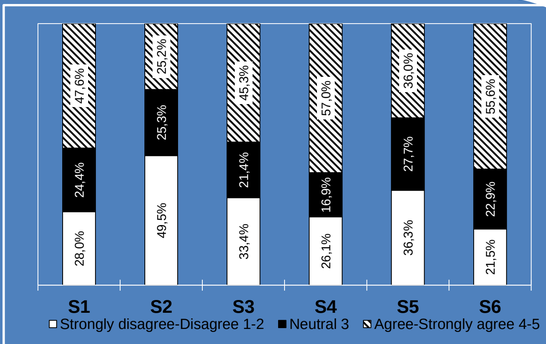




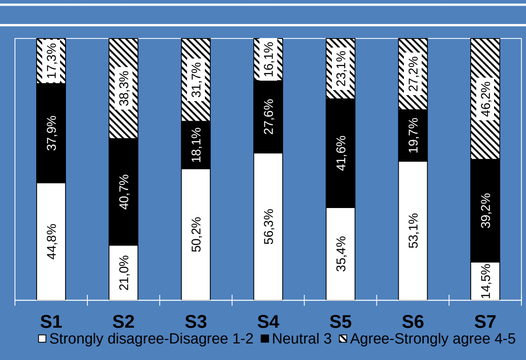
Q1: Are you somehow involved in aquaponics? Have you designed and built an aquaponics system and do you run an aquaponics system by yourself?

Q2: Have you ever heard of hydroponics?

Q3: Have you ever heard of aquaponics?



S1: I actively look for ways to buy from local farmers (e.g. buy at open air markets or directly from farmers).
S2: When I buy food I have to consider price as the most important factor for the decision.
S3: When I buy vegetables I look for pesticides and herbicides free produce.
S4: If the price of organic produce is twice the price of non-organic produce, I decide for non-organic produce
S5: I am careful when buying fish and rather pay more for organically produced fish.
S6: When buying in a supermarket I take the locally produced food, even if it is more expensive.



S1: Next time when I will buy vegetables I will look for aquaponically grown vegetables.
S2: When deciding between conventionally farmed fish and aquaponically farmed fish I would choose aquaponic fish.
S3: Most of the scare about pesticides and herbicides is exaggerated.
S4: I like the idea, but I doubt I would actually eat the fish or vegetables grown in this way.
S5: I would choose aquaponics fish even if they would cost more.
S6: The only true vegetable production is in soil.
S7: Aquaponics is the answer to a more sustainable food production.

Conclusion

The aim of the study was to estimate the consumers‘ awareness of aquaponics and acceptance of aquaponics products in different European regions. The results showed that the knowledge about aquaponics is rather limited with 53.9 % of the responses claiming they have not heard about it. However, the answers are overall positive towards the idea and approximately 23 % claim they would be willing to pay more for products produced in aquaponics compared to traditional products but it should be emphasized that the consumers‘ focus is on production free from pesticides/herbicides and antibiotics and locality. The survey is in continuation and the questionnaire is already being translated to Italian, Hungarian, German, French and Czech language in order to extend the population sample to other European regions.

Acknowledgments

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