STUDY UPON ROMANIAN CONSUMERS' ATTITUDE ABOUT ENTOMOPHAGY

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Abstract. In certain parts of the world insects consumption has been practiced by humans since ancient times. Nevertheless, in North America and Europe entomophagy is still a very controversial concept taking into account the nutritional value of insects and the disgust they induce to consumers. The main objective of this study is to determine the Romanian consumers' attitude about consumption of insects. The study revealed that more than a half of the respondents are not interested in consuming insect, mainly due to the disgust they produce. Anyway, it would be more attractive to consume insects in a restaurant than at home. The ones who would consume insects prefer crickets and locusts prepared by frying. At the same time, the consumers consider that the best dish in which insects are suitable to be included is salad.

Keywords: edible insects, alternative food, preference of entomophagous people, willingness to eat, nutritional value

INTRODUCTION

Entomophagy, the practice of eating insects by humans (Macedo et al., 2017), is well known in certain parts of the world. Even there are countries in which insects are considered a delicacy, in the Western societies eating insects is associated with disgust, primitive behavior (Jansson and Berggren, 2015) and unsafety. In this context, legislation of insects as food and feed is still under consideration atthe European Union(Marberg et al., 2017).

The followers of entomophagy bring as arguments both the ecological and nutritional aspects. From ecological point of view, the anticipated growth in worlds' population will require an increase of food production from existing agro-ecosystems, leading to a great pressure on the environment (Neves, 2015).This pressure comes from deforestation and grassland conversion in the case of conventional agriculture, as well as from emissions caused by animal husbandry, transporting and processing. The nutritional aspect regards a good ratio between energetic value and protein content, good amino acid and fatty acid profiles and high contentsof a variety of micronutrients (Nowak et al., 2016). At the same time, Payne et al., (2016) highlighted the potential of certain insects to combat micronutrient deficiency.

Despite the positive related entomophagy aspects mentioned above, in the civilized societies there is still a strong reticence of the consumers. There have been reported numerous studies regarding the opportunity of using insects as unconventional food source in Europe. The consumer's attitude against introducing insects in their diet was studied in Czech Republic (Bednářová et al., 2013), Belgium (Verbeke, 2015), Germany (Hartmann et al., 2015), Hungay (Gere et al., 2017) andNetherlands (Marberg et al., 2017).

As long as Romania tends to join European concearns in the field, the main objective of this study is to establish the Romanian consumer's atitude regarding the insect consumption.

MATERIALS AND METHODS

Data were collected in February 2018, using a printedquestionnaire applied to 74 respondents in Braila and Galati counties, Romania. The participants were not remunerated for their activity. In the first section thequestionnaire included items about education, gender, sex, place of living and occupation (adapted from Gere et al., 2017). In order to establish the food habits of the respondents, they were asked to state the food category that predominates in their daily diet. Another important item of the questionnaire was about the familiarity of the term 'entomophagy'. The second section of the questionnaire contained the following questions: 'Would you be willing to consume insects?'; 'Would you be willing to consume foods containing insect based ingredients?'; 'In the case you wouldn't be willing to consume insects or insects based ingredients, which is the reason/reasons?'; 'In the case you would be willing to consume insects, which of the following species would you try?'; 'In the case you would be willing to consume insects, please specify which of the following preparation techniques is the most attractive.'; 'In the case you would be willing to consume insects, please specify which of the following dishes would be the most suitable to contain insects.' and 'In the case you find insect based dishes in a restaurant's menu, would you be willing to order such a dish?'. The data were processed using Microsoft Excel 2010 program.

RESULTS AND DISCUSSIONS

The first part of the questionnaire revealed that the most interested people in this subject were less than 20 years (43 from the total of 74 respondents). The second important age group was 21-40 years (23 respondents) and the rest were above 40 years. This means that young people are more interested in participating to this study. At the same time, it can be noticed that the most of the respondents (57%) have primary or secondary education, the rest of them having higher education. This can be correlated with their occupation, which stated that almost 80% of the respondents are students. The most of participants were females (73%), and this may be correlated with other studies (Macedo et al., 2017, Gere et al., 2017) in which it was stated that women have the tendency to try more innovatory foods. Regarding the place of living it could be said that urban and rural areas are represented approximatively in equal parts. Despite the young age, 77% of the respondents consume all types of food categories, showing a high interest for a healthy diet.

When asked about the knowledge of the practice of eating insects, 86% from the respondents answered 'yes' but only 19% knew what 'entomophagy' means. Similar studies showed that in Hungary almost 60% of the respondents have heard about eating insects (Gere et al., 2017), while in Belgium this percent is 71.5 (Verbeke, 2015). In another similar study published in 2017, Macedo et al. stated that 17.6% from the respondent in Brasil knew what 'entomophagy' is. The high percent of respondents knowing about the meaning of 'entomophagy' and the practice of eating insects registered in Romania, could be explained by the access to information through Internet.

The respondents were asked to name the insects about they had heard that are eaten. The most of them answered locusts (32%) and crickets (28%). Other insects like silkworms (10%), termites (9%) and mealworms (8%) were also mentioned.

At the question 'Would you be willing to consume insects?' 51 of the respondents answered 'categorically no', while 16 respondents stated that they would taste only to satisfy their curiosity and 5 respondents answered that they would consume insects only if they couldn't be seen (figure 1). Only 2 respondents were decided to consume insects.

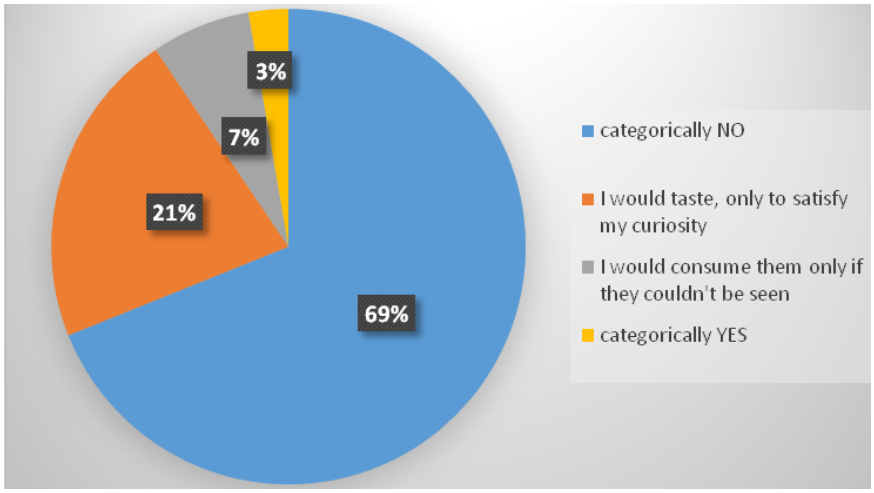


Fig. 1. The answers at the question 'Would you be willing to consume insects?'

In a similar study realized in Brasil, 82.4 % from the respondents answered that they wouldn't be willing to consume insects (Macedo et al., 2017). Slight different results were obtained regarding insect based ingredients. It seems that the consumers are less reticent to insect based ingredients comparing to the insects themselves (figure 2).

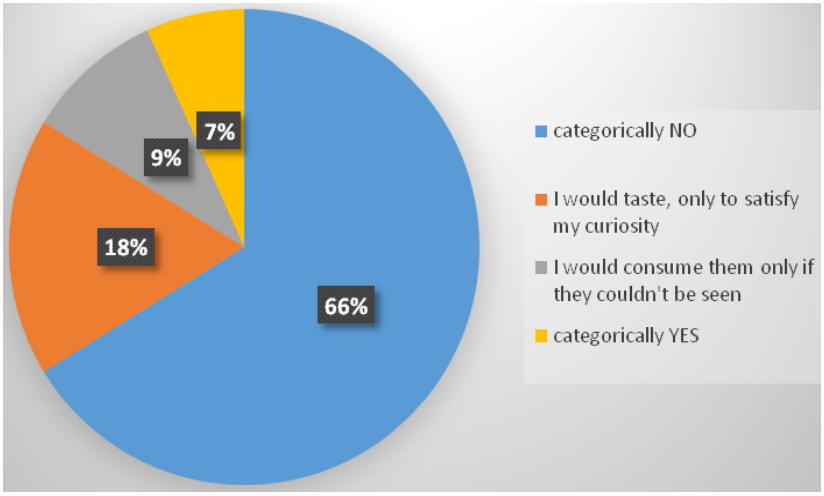


Fig. 2.

As it can be noticed in figures 1 and 2, the curiosity is a very important factor when it comes from insect consumption. On the other hand, according to Tan et al. (2016), consumers may be willing to taste unusual foods out of curiositybut may not be willing to eat them again if the food is not regardedto be tasty nor appropriate for consumption.

The main reason for which the respondents are not interested in consuming insects or food containing insect based ingredients is the disgust they produce, according to 35 of the respondents. Another reason is the consideration that the insects are not safety for consumption and could cause illness (15 responses). These reasons were expected taking into consideration the European cultural aspect and food behavior. In figure 3 are represented the insect species that the respondents would try. The most attractive insects for consumption are crickets and locusts. This results are comparable with the ones reported by Macedo et al.

(2017), in Brasil. The main difference is that, in their study, the greatest preference was registered for ants, maybe for cultural reasons. Anyway, the preferred preparation method seems to be the same, frying: 67% from the Romanian respondents and 86.7% from the Brasilian respondents.

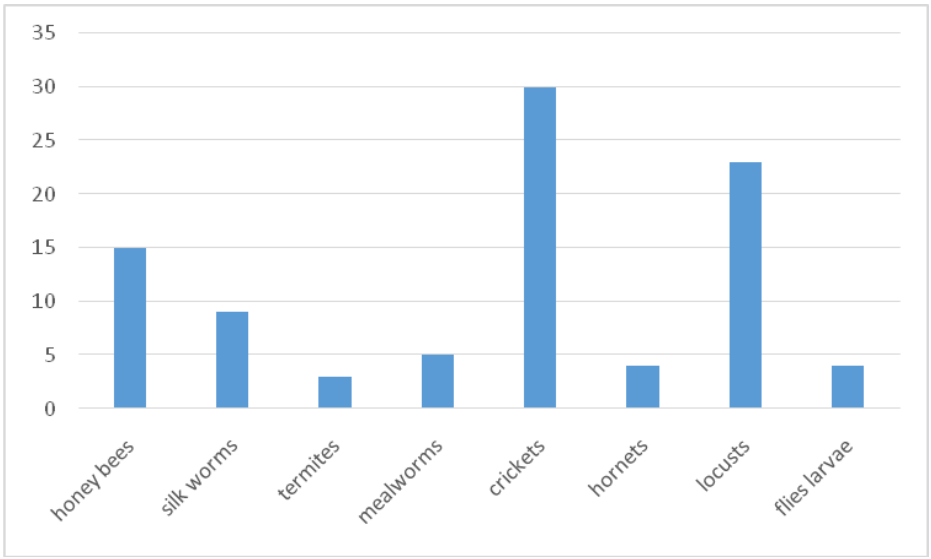
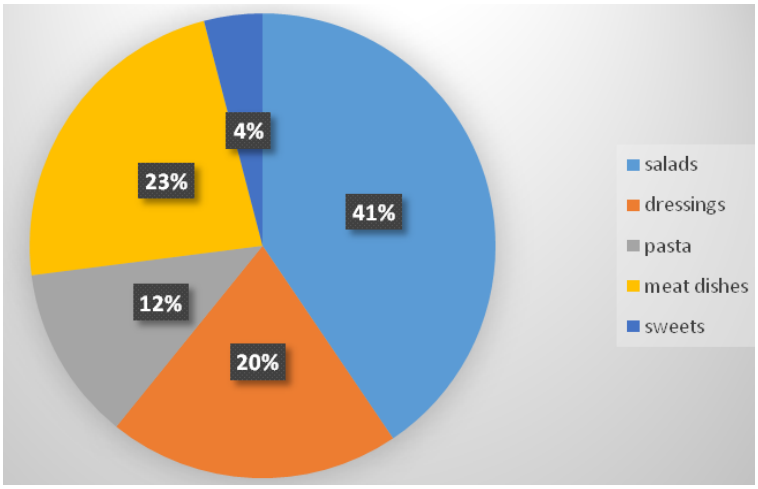


Fig. 3. The insect species that consumers would try

In figure 4 are presented the responses for the question 'In the case you would be willing to consume insects, please specify which of the following preparation techniques is the most attractive.'It can be noticed that the most suitable dish to contain insects is salad, but meat dishes are also important to take into consideration, maybe due to the association of insects, which are rich in valuable proteins (Zielińska et al., 2015; Tiencheu and Womeni, 2017), with meat.



Figu.4. Dishes suitable to contain insects

The final question was about the willingness to try an insect dish if it would be founded in the menu of a restaurant. The number of respondents who 'categorically would not try' in a restaurant is lower than the number of those who 'categorically would not try'

in general, showing that it would be easier to try food that is not made by themselves. The curiosity is again one of the facts to be considerate.

CONCLUSIONS

The Romanian consumers, as the most of the consumers in the civilized societies, are reticent when it comes from insects consumption. This is due to the association of insects with disgust and unsafety in consumption. Even the world resources tend to decrease in the next 50 years, in Romania the traditional agricultural practices are still available and people are not concerned about food resources. A proper informing of people about the good aspects of insects consumption would make them change their opinion, but, as other studies revealed, for the moment, in Europe, insects are not attractive to be included in diet.

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