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Perception and Attitude of Youth on the Use of insects as Food and Feed, Kenya

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Date Published: ABSTRACT

02 Jun 2022 There is no doubt about the nutritional value and environmental impact of edible insects; they are a good substitute for source of protein. However, incorporating them in the human daily diets requires an intense change in mentality of youth in

Keywords: Kenya. People's attitude towards a food product is important when it comes to its acceptance. Therefore, the aim of the research was to explore the perception and attitude of young people in Kenya on the utilization of insects as food and feed. The findings showed that Kenyan youth have a neutral to a possible positive perception and attitude regarding the use of edible insects as food and feed. The findings of a logistic regression analysis show that education level is associated with low likelihood of consuming and using insects as livestock feed. The perceived benefits, feelings and intentions were also associated with low probability of insects consumption and use as livestock feed. However, 79.9% of respondents were willing to incorporate insects in their food diets and 75.6% were willing to use them as a source of income.

Africa,
Food Diets,
Negative Response,
Social Influence,
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INTRODUCTION

According to Min-harris (2009) out of the forty eight poorest countries in the world thirty-two are found in the Sub-Saharan Africa. The high number is made possible because of issues like clinical diseases such as HIV/AIDS, dysfunctional governments, and conflicts. People living in rural areas; their livelihood and food security is vulnerable since nearly all the Sub-Saharan Africa agricultural activities are dependent on rain which is at a high risk due to weather shocks. The lack of social services in the Sub-Sahara Africa, especially in education and health care is a major problem in coping with challenges of hunger and poverty. People living in extreme poverty tend to be young people. Poverty among the youth have the same characteristics as that of a larger population, it is common in rural areas and more severe among females. However, poverty is greater among the youth than in the general population. Over 500 million youth survive on a daily budget below US\$ 2 and 43% of the world's youth labour force is either unemployed or stuck in poverty while working (Castaneda et al., 2016). South Asia has a significant portion of the disadvantaged youth in the world, this equates to four out of ten young people surviving on less than a dollar or two a day. In Africa poverty among the youth is chronic and rising, with about 46% of young people living on less than US\$ 1 per day. Three out of ten young people in Sub-Saharan Africa live on less than US\$ 1 per day, while two out of ten live on a regular budget of less than two dollars a day (UN, 2005; Moore, 2005).

FAO in 2009 reported that by the year 2050 there is a need to increase food production by 70% to be

able to sustain every human life around the world (Lensvelt & Steenbekkers, 2014). The human population is predicted to increase to about 9 billion in 2050; as such there is rapid increase in demand for food especially the animal protein. This is more evident in developing countries and emerging economies where there are high food shortages. Currently accessibility of animal protein in developing countries is a challenge because of high prices and change in climate that has led to low production of livestock. Despite the challenges, the demand for animal protein is expected to increase more in future therefore, it is imperative that there is an increase in protein production to meet the demand (Alemu et al., 2015). The increasing world food demand has led to the edible insect movement as one of the strategies to increase and diversify food to tackle food security. Entomophagy is gaining popularity worldwide and Africa is no exception as it has been part of the traditional diet of many local communities.

In Southern Africa two thirds of the population's animal protein intake is from insect. Insects are considered a valuable food source for the future since they are very healthy; they are a good source of essential nutrients (Van Huis et al., 2013). Despite their tremendous benefits in food and feed production, the youth appear to have some reservations about the utilization of edible insects (Melgar-Lalanne et al., 2019). Vaccaro *et al* (2019) explained that insects are seen as pests and quite a few of them are found around decomposing matter, as such depicting an unclean, unhygienic and disease-causing images that induce distasteful and negative responses towards them, consequently rejecting them as food. Even though entomophagy is being practiced in Africa, there is some high level

of non-acceptance by some communities because of the negative perception that is associated with their physical appearance. In a study conducted in Italy by Sogari *et al* (2017), young people were curious and willing to consume edible insects but they feared disapproval from their family members and friends.

Social influence has a major impact on the willingness to consume edible insects. Data highlight those pessimistic judgments that people get from their peers and relatives regarding entomophagy are significant. They can hinder an individual from including edible insects in their diets. Processing insects and incorporating them in familiar foods can be one way to reduce rejection of insects as food. This is supported by some studies which show that consumers are more likely to eat processed insect products (Wilkinson *et al.*, 2018; Hartman *et al.*, 2015; Tan *et al.*, 2015).

MATERIALS AND METHODS

Study Area

The study was conducted in Vihiga County, which is in Western Kenya. There are five sub counties within the Vihiga County; Vihiga, Luanda, Sabatia, Hamisi and Emuhaya. In conformity with the National Population and Housing census conducted in 2019, the county's population was around 590,013 people (KNBS, 2019). The county has the highest population densities than any other county in the country at 1, 033 persons per square km. Vihiga county population presents a youthful population consisting of 46 percent people aged between 15-35 years.

Study Design and Sampling Procedure

The study adopted a descriptive research design with a quantitative approach. A questionnaire was developed to capture the demographic characteristics of respondents, a five-point Likert scale was used to measure the perception and attitude of respondents towards the use of insects as

food and feed. Data was collected from 270 young adults of the age range 18 to 35 years. This research was approved by the Ethical Review Committee and Board of Postgraduate Studies of Jaramogi Oginga Odinga University of Science and Technology. A consent form was given to respondents before completing the questionnaire hence; all respondents who took part in the study were given sufficient information and assurances of anonymity about the study so that they participate voluntarily on the basis of informed consent.

Data Analysis

The data obtained from the questionnaire was coded and entered in the Statistical Package for Social Sciences (SPSS ver.25). Perception and Attitude statements which were in negative form were reversed in order for them to be in the same direction with others. Perception statements were then categorized into Beliefs, Risks and Benefits while Attitude statements were grouped into Feelings and Intentions. Multicollinearity was done using linear multiple regression to check correlation among the statements and between the independent variables being; demographic characteristics, Beliefs, Risks, Benefits, Feelings, and Intentions. The tolerance and Variance Inflation Factor (VIF) values were within the acceptable values of 2.5 (Johnston *et al.*, 2018).

RESULTS AND DISCUSSION

Demographic Characteristics of Respondents

The gender distribution was almost the same, with males (51.5%) slightly higher than their female counterparts. The majority of respondents indicated that they have tertiary education (61.1%). The study showed that 39.6% of respondents were unemployed. Participants were asked to indicate if they consumed insects and if they used insects as livestock feed. Despite the occasional use of insects by youth, 74.4% of respondents consumed edible insects while only 23.7% fed their livestock with edible insects.

Table 1: Demographic characteristics of respondents

Demographic Characteristics		f	%
Age	18-23	84	31.1
	24-28	97	35.9
	29-35	89	33.0
Gender	Male	139	51.5
	Female	131	48.5
Educational level	Secondary	105	38.9
	Tertiary	165	61.1
Employment status	Full time	15	5.6
	Part time	19	7.0
	Self employed	67	24.8
	Unemployed	107	39.6
	Student	62	23.0
Do you consume edible insects?	Yes	201	74.4
	No	69	25.6
Do you use edible insects as feed?	Yes	64	23.7
	No	206	76.3

Regression Analysis

The statements measuring perception were grouped into three categories; Beliefs, perceived risks, and benefits. Statements measuring Risks and Beliefs had mean values close to 3, while the Benefits statements had a slightly mean value above 2,

indicating that respondents were neutral about their overall perception on the use of insects as food and feed. Attitude statements were grouped in Feelings and Intentions. The statements measuring both groups had mean values above 2 or close to 3, which indicates that youth were neutral about their feelings and intentions towards using insects as food and food.

Table 2: Regression analysis on the utilization of edible insects

	Consumption of insects				Use of insects as livestock feed			
	β	SE	Sig	Exp(β)	β	SE	Sig	Exp(β)
Gender	.232	.361	.519	1.262	-.248	.305	.416	.780
Education level	-.437	.153	.004*	.646	-.038	.130	.768	.962
Employment	.203	.174	.242	1.137	-.119	.142	.402	.888
Risks	.129	.277	.643	1.137	.042	.228	.853	1.043
Benefits	-2.713	.479	.000*	.066	-.596	.365	.102	.551
Beliefs	.443	.295	.133	1.558	-.164	.247	.505	.849
Feelings	-.953	.321	.003*	.386	-.838	.260	.001*	.432
Intentions	-1.442	.370	.000*	.237	.371	.282	.189	1.449

Note: * implies statistical significance at 5% level

Socio demographic characteristics, perception and attitude were tested whether they affect the utilization of insects as food and feed. *Table 2* presents the results of the two logistic regression models with the estimated odds ratio, regression coefficients, significance level and standard errors

between the probability of a person using or not using insects as food and feed. Gender and employment did not influence the consumption and the use of insects as livestock feed. An increase in education level was found to be associated with a 0.646 decrease in the probability of a respondent to

consume insects. Respondents who perceived higher benefits were less likely to consume insects. This is in line with Manditsera *et al.* (2018) who reported a negative relationship between education and the consumption of edible insects. A possible explanation to this could be the fact that, young and educated people are highly influenced by Western culture as such adopting the diets and shy away from eating traditional foods including edible insects. Perception in terms of the perceived benefits is statistically significant with a negative relation towards the consumption of edible insects. The odds ratio of perception is 0.066. This indicates that a respondent is 0.066 less likely to consume edible insects despite perceiving insects as beneficial.

The results showed that youth have a positive perception towards edible insects but they are less likely to eat them. This is in contrast with Verbeke (2015) study that showed that young people were more likely to consume edible insects due to their positive perceptions about them. An explanation to this relationship may be due to changing lifestyles and food preferences. The results indicate that there is no statistically significant relationship between perception and the use of edible insects as livestock feed. The results also revealed that an increase in attitude in regards to the respondents' Feelings such as disgust and Intensions that include eating insect when used as a food ingredient, an individual is less likely to use insects as food and feed. Disgust and other negative emotional associations with insects as food are accompanied by reduced willingness to

eat (Gmuer *et al.*, 2016). An individual's willingness to consume edible insects is influenced by their attitudes. The finding of the study is in line with Steggerda (2015), who discovered that intentions to consume edible insects was attributed to the attitude towards them.

Disgust-based rejection is frequently triggered by a bad taste anticipation, unusual consistency, or doubt about the food's provenance (Martins, 2006). This was observed on insects such as dung beetle, the place in which this insect grows made it difficult for some respondents to accept it as food. Hence the insect was perceived as dirty and that it might cause diseases. A caterpillar received the same reaction because they are not familiar with insect. Attitude (Feelings) is statistically significant and negatively related to the use of edible insects as feed. The odds ratio of attitude implies that an increase in positive attitude a respondent is 0.259 times less likely to use edible insects as feed. This result is also different from Domingues *et al* (2020) who reported that, positive attitudes were connected with the likelihood of adopting insects as livestock feed. Additionally, Chia *et al* (2020) showed that respondents had a positive attitude towards using edible insects as livestock feed.

Willingness of Youth to Use Edible Insects

The results in *Table 3* show that most youth are willing to use edible insects as part of their food diets; this is indicated by 79.9% score while 20.1% were unwilling.

Table 3: Willingness to incorporate edible insects in food diets

		f	%
Willingness	Yes	215	79.9
	No	55	20.1
	Total	270	100.0
Reason	Familiar with 1 edible insect	4	7.3
	Preference	16	29.1
	Disgusting	7	12.7
	Requires time and energy to get them	6	10.9
	Religion	22	40.0
	Total	55	100.0

Youth who were not willing to consume edible insects indicated that religion (40.0%) was the main reason for their unwillingness as shown in *Table 3*. To some religions edible insects are regarded as blasphemous, unhygienic, and detrimental to health. It was also noted that 29.1% showed that it was due to their food preferences, 12.7% indicated that

consuming edible insects was disgusting, 10.9% said that harvesting requires time and energy and the remaining 7.3% indicated that they are only familiar with 1 edible insect. Eating one type of edible insect can be monotonous as such causing a decline in the consumption of edible insect.

Table 4: Willingness to use edible insects as a source of income

		f	%
Willingness	Yes	204	75.6
	No	66	24.4
	Total	270	100.0
Reasons	Seasonality of edible insects	20	30.3
	Difficult to harvest	11	16.7
	Low populations	17	25.8
	Lack of experience in working with edible insects	11	16.7
	Requires high capital to start up	1	1.5
	No market	6	9.1
	Total		66

Information in *Table 4* indicate that 75.6% of youth were willing to use edible insects as a source of income while 24.4% found the idea not appealing to them. Respondents gave the reasons in *Table 4* for their unwillingness to use edible insects as a source of income. They included seasonality (30.3%), low populations of edible insects (25.8%), not easy to harvest (16.7%), having no experience in working with edible insects (16.7%), no established markets (9.1%) and high capital required to start the edible insects business (1.5%). The low populations of edible insects are caused by changing weather patterns hence relying on the insects from the wild may affect business badly. High population of insects are seen during rainy seasons, making the business to bloom at that particular time and go down during the dry season meaning there will be high fluctuations in terms of profits and sustainability of the business is not guaranteed. Wagner *et al* (2021) explained that the decline of edible insects is caused by the habitat loss. The change in land use and urbanization has caused

degradation of landscape leading to the loss of natural habitat.

CONCLUSION

Despite youth indicating that they use insects as food and feed, there is low adoption of entomophagy as meat substitute. Even so, the concept of edible insects as a source of food and feed has the potential to grow among young people. Interestingly it was discovered that respondents were willing to incorporate insects in their diets and also use them as a source of income. Basing on the findings, it was indicated that social influence may have strongly affected the use of insects as food and feed. Learning about entomophagy from family and members of the community shows that the social set plays a significant role in the eating habits of the younger generation. Youth have neutral to a possible positive perception and attitude towards the use of insects as food and feed as such community sensitization and education through media and social groups should be used to change the mentality

and promote insect utilization. Common insects such as termites, crickets, grasshoppers and dung beetle can be promoted as food and/or feed to improve the acceptance of edible insects among the youth.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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