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Influence of Knowledge and Perception on the Utilization of Some Under-utilized Legumes Among Nigerian Students

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ABSTRACT

Background: Various efforts have been made to improve utilization of neglected and under-utilized legumes at home, cottage and industrial levels, however, utilization is still low. Objective: To identify the major constraints to the utilization of some under-utilized legumes (soybean, lima-bean, pigeon-pea, kidney-bean and bambara groundnut). Methods: Structured and semi-structure questionnaire were used to assess information from students of Institute of Agricultural Research and Training, Obafemi Awolowo University, Nigeria. Data was analyzed using descriptive statistics. Pearson Chi square was used to test the hypotheses.Results: Soybean stands out among the studied under-utilized legumes in terms of knowledge and perception among respondents. More than half of the respondents (54.6%) had heard of or read about soybean while only 2% had heard of or read about lima bean; 52.6% had seen soybean while 2.6% had seen lima bean; 49.3% had soybean in their present food timetable while none of the respondents (0%) had lima bean in their present food time table. Knowledge of the underutilized legumes followed the order, soybean> pigeon pea>kidney bean>bambara groundnut>lima bean. Pearson Chi square analyses revealed that non recognition and lack of information on the under-utilized legumes affected utilization, but hard to cook nature of the under-utilized legumes did not affect their utilization. The constraints to the utilization of the studied under-utilized legumes are non-recognition and lack of information. Conclusion: Nutrition education programs and seminar should be designed and implemented to raise the level of knowledge on nutrition and health benefit of the underutilized legumes.

Keywords: Under-utilized legumes, knowledge, perception, students, Nigeria

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Introduction:

In developing countries like Nigeria, the rate at which the population is increasing cannot be matched with increase in food production; therefore, for food security to be achieved, apart from increasing the production of main crops, other crops that have been neglected should be given attention. Neglected and underutilized crops are domesticated plant species that have been used for food, fiber, fodder, oil, or medicinal properties; however, these food crops have been reduced in importance over time, owing to some constraints like poor shelf life, unrecognized nutritional value, poor consumer awareness, and reputational problems (stigmatized as poor man's food). Some crops have been so neglected that genetic erosion of the gene pools has become so severe that they are regarded as lost crops (1). Underutilized food crops play an important role in the sub systems and economics of the poor people in developing countries; particularly in the agro bio-diversity (2). Many under-utilized food crops are adapted to marginal soil and climate condition, and are well adapted to their environment (3). Despite these, underutilized crops are marginalized by farmers and consumers.

Legumes have been reported to serve as a source of non-processed protein for rural and urban dwellers of the population, especially in the poor countries of the world (4); legumes are good sources of fiber, and resistant starch, as well as other nutrients, therefore, they are one of the food crops that have the least glycemic indices (5). Nigeria is blessed with variety of grain legumes that could be used to address the protein deficiency problems that is prevalent in the country; however, these legumes are underutilized, as consumption have centered mainly on cowpea, and groundnut (6). The common legumes are very expensive, and are out of reach of the poor masses. Several other locally available species like soybean, bambara nut, kidney bean, Lima bean, pigeon pea, Jack bean, etc. which show remarkable adaptation to tropical conditions are less commonly used by the people. Efforts are being made to improve on the production and utilization of the many legumes that are currently under-utilized in Nigeria. It has been suggested that harvesting equipment, mechanical sheller, and solar drying system, be given to processors of bambara groundnut in Nigeria to improve production within the North Eastern part of the country (7). Also (8) suggested that equipment utilized in household and local processing of under-utilised legumes be upgraded to allow for increased production, reduced drudgery, and efficient time management. Other works (9, 10, 11, 12, 13, 14, and 15) reported the various ways of improving utilization of some underutilized legumes.

Despite various efforts made to improve utilization of these legumes, at home, cottage and industrial levels; utilization is still low, therefore, the main objective of this research was to identify the major constraints to the utilization of some under-utilized legumes.

Materials and Methods

Study area: The study was carried out within the Institute of Agricultural Research and Training (IAR&T) community, which comprise of Federal College of Agriculture, Federal College of Animal Health and Production Technology, and the Research Institute of Obafemi Awolowo University. IAR&T, is located in Ibadan, South West, Nigeria; it lies within the geographical co-ordinate of 7˚23ˈ16˝ N and 3˚53ˈ47˝E

Population and sampling: The population for this study consisted of students of Federal College of Agriculture, and Federal College of Animal Health and Production Technology, IAR&T Ibadan. A total of 150 students were selected randomly from about 400 students that agreed to take part in the survey; respondents were selected by ballots.

Data collection: Structured and semi-structured questionnaire was used for the survey. The questionnaire was designed to elicit information on assessment of knowledge and perception of respondents on some under-utilized legumes. Questionnaire was written in English, and was pre-tested on 5 participants before giving to the other 145 to make up 150 participants. Samples of the under-utilized legumes were shown to the participants for clarification while filling the questionnaire. Researcher made sure that all questions were appropriately answered.

Analyses of data: Data was analyzed using SPSS version 15.0. Frequencies and percentages were determined by descriptive statistics, and

Table 1: Demographic data of respondents

Age (yrs)	Frequency	Percentage (%)
≤ 15	1	0.7
16-25	131	87.3
≥26	18	12.0
Total	150	100
Sex		
Male	98	65.3
Female	52	34.7
Total	150	100
Marital status		
Married	11	7.3
Single	139	92.7
Total	150	100
Religion		
Christianity	62	41.3
Islam	79	52.7
Traditional	9	6.0
Total	150	100
Ethnicity		
Yoruba	122	81.4
Igbo	17	11.3
Hausa	11	7.3
Total	150	100
Educational level		
ND1	62	41.3
ND2	53	35.3
HND1	25	16.7
HND2	10	6.7
Total	150	100

Pearson chi-square analysis was used to test hypotheses drawn.

Null hypotheses tested:

1. Non recognition of the under-utilized legumes is not responsible for their low utilization
2. Lack of information on the nutritional value of the under-utilized legumes does not result in low consumption of the legumes
3. Hard to cook nature of the under-utilized legumes does not result in low utilization

Results

Table 1 shows the personal data of the respondents. Only one respondent was 15 years of age; majority of the respondents (131), representing 87.3% were aged 16-25 years. The remaining 18 (12%) were 26 years and above. Most of the respondents were male (65.3%), and (92%) were single. Majority of the respondents (79), representing 52.7% practiced Islam, while 60 (40%) practiced Christianity; only 9 respondents (6%) practiced traditional religion. Out of the 150 respondents, 121 were from the Yoruba ethnic group, 17 were Igbos, and 11 were from the Hausa ehnic group. Most respondents were from ND1 (62) and ND2 (53); respondents from HND1 made 6.7% i.e. 25 respondents, while HND2 students constituted about 53% of respondents.

Knowledge of respondents on some under-utilized legumes is captured in Table 2. Majority of the respondents (54.6%) signified to have read or heard about soy beans. The under-utilized legume that is least known by respondents is lima bean (2.7%). The order in which respondents have heard or read about the under-utilized legumes is soybean > pigeon pea > kidney bean > bambara groundnut > lima bean. Soya bean was identified as legume that is mostly seen (52.6%) and presently in food time table (46.7%); this is followed closely by pigeon pea (14.6% and 20.7%); kidney bean (14% and 17.3%), for underutilized legumes seen and under-utilized legumes presently in food time table respectively.

Tables 3, 4, and 5 showed the result of statistical analyses used to test the drawn hypotheses using pearson chi-square. The result obtained showed that recognition of the under-utilized legumes either by sight, or through reading, affected their utilization. However, the result obtained revealed that hard to cook nature of the under-utilized legumes did not result in low utilization.

Discussion:

In Table 1, it is not surprising that majority of the students were within age bracket (16-25) years; age bracket of college students had been reported to range from 16-28 years (16). The higher percentage of respondents being Yorubas is expected because IAR&T is situated in Ibadan, a South-Western city in Nigeria; the part of the country which is the domain of the Yorubas. The result obtained in Table 2 showed that soybean is the most common of all the studied under-utilized legumes; this is due to past works on utilization and processing of soybeans; many soybean based recipes have been developed, such as soymilk, soy-iru, soy yoghurt, soy ice cream and soy flour (17, 18, 19, 20, 21). Our result corroborates the work of (22) who confirmed that in Nigeria, soybean is gaining attention over other neglected and under-utilized leguminous species. In times past, research has indicated that the poor utilization of the under-utilized legumes is basically due to their hard to cook nature (8, 3, 21); however, this present work revealed that among the respondents, hard to cook nature of the legumes did not necessarily affect utilization; the factors that affected utilization of the studied legumes were non-recognition either by sight or through reading; and lack of information on the under-utilised legumes (Tables 3, 4, 5). The researchers are of the opinion that the use of pressure cooker and pressure pot in household food processing is gradually gaining grounds among the elites in Nigeria, and the respondents are part of this group, being students; this may have led to the finding that the hard to cook nature of the legumes did not affect utilization. (8) had earlier suggested that equipment utilized in household and local processing needed to be upgraded to allow for increased production, reduced drudgery, and efficient time management.

Conclusion and recommendations:

The result obtained from this study showed that bambara groundnut, lima bean, kidney bean, and pigeon pea are currently under utilized due to non-recognition, and lack of information on

Table 2: Knowledge of respondents on some under-utilized legumes

Legumes heard of or read about	**Frequency**	**Percentage**
Soy bean	82	54.7
Bambara groundnut	18	12
Lima bean	4	2.7
Pigeon pea	19	18
Kidney bean	27	12.6
Total	150	100
Underutilized legumes seen		
Soy bean	79	52.6
Bambara groundnut	19	12.6
Lima bean	8	5.2
Pigeon pea	22	14.6
Kidney bean	21	14
Total	150	100
Under-utilized legumes presently in food time table		
Soy bean	70	46.7
Bambara groundnut	13	8.6
Lima bean	10	6.7
Pigeon pea	31	20.7
Kidney bean	26	17.3

Table 3: Pearson chi-square table showing relationship between recognition of under-utilized legumes and utilization

	Value	**Df**	**Assymp.Sig 2 sided**
Pearson chi-square	771.229a	240	0.000
Likelihood	201.640	240	0.966
No of valid cases	150		

Pearson chi-square is less than 0.05 ($p<0.05$) i.e. it is significant; therefore the recognition of the underutilized legumes affected the utilization of the under-utilized legumes affected the utilization of the under-utilized legumes.

Table 4: Pearson chi-square table showing relationship between lack of information on under-utilized legumes and utilization

	Value	**Df**	**Assymp.Sig (2 sided)**
Pearson chi-square	744.050a	304	0.000
Likelihood	191.481	304	1.000
No of valid cases	150		

Pearson chi-square is less than 0.05 ($p<0.05$) i.e. it is significant. Therefore, lack of information on the under-utilized legumes resulted in low consumption of the legumes.

Table 5: Pearson chi-square table showing relationship between hard to cook nature and utilization of legumes

	Value	**Df**	**Assymp. sig 2 sided**
Pearson chi-square	35.643	32	0.301
Likelihood	31.895	32	0.472
No of valid cases	150		

Pearson chi square is gerater than 0.05 ($p>0.05$); therefore, hard to cook nature of the under-utilized legumes did not result in the low utilization of the legumes.

health and nutritional benefits. Much work needs to be done on promoting the utilization of the under-utilized legumes under review. Nutrition education and awareness program should be implemented to raise the level of knowledge on nutritional and health benefits of the under-utilized legumes studied.

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