



HOUSEHOLDS' PREFERENCE AND USAGE OF COWPEA-BASED PRODUCTS AND VARIETIES IN WESTERN ZONE OF BAUCHI STATE, NIGERIA

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ABSTRACT

The study examined the households' consumption preference for cowpea and its products in Western zone of Bauchi State, Nigeria. A multi-stage sampling procedure was employed in the selection of 210 households. Data were collected using questionnaire and analyzed with descriptive statistics and multinomial logistic regression. The study revealed that majority (75.7%) of households' highly preferred alale as cowpea-based products and used kwankwasiya cowpea variety to make kosai (52.3%), alale (87%), cowpea soup (39.5%), rice and beans (53.3%) dishes, respectively. Furthermore, 35.7% of households prefer to consume kwankwasiya cowpea variety than other varieties. The result of the multinomial logistic regression analysis revealed that, age (P<0.05), educational level (P<0.1), occupation (P<0.1), income (P<0.1), price (P<0.01), time taken to cook (P<0.1), taste (P<0.05) and weevil damage tolerance (P<0.05) were statistically significant in determining the factors influencing households' consumption preference for cowpea varieties. The major constraints to household preference for cowpea consumption include high cost of cowpea (97.1%), insect infestation (81.4%) and abdominal discomfort (70.0%) among others. The study concluded that households' highly preferred *alale* as cowpea-based products and used *kwankwasiva* cowpea variety to make different dishes. The study recommended that effort should be made by stakeholders and breeding institutions to create policies that would be favourable to control the menace of price fluctuations of cowpeas and cowpea farmers should divert more resources to the production of kwankwasiya cowpea variety so that they can meet consumer demand and increase their level of income.

Keywords: Cowpea, Consumption, Forms, Usage, Preference, Bauchi, Nigeria.

INTRODUCTION

Cowpea (*Vigna unguiculata*) is one of the most important grain legumes which are widely cultivated in semi-arid areas of the tropics and subtropics for human as well as animal consumption. In West and Central Africa, the most important cowpea growing regions in the World, cowpea constitutes the cheapest source of dietary protein for the low-income sector of the population (Luka *et al.*, 2015). Cowpea leaves, green pods, green peas and dry grains are consumed as food by humans and the haulms which contain about 20% protein are fed to livestock. Cowpea is often referred to as the poor man's meat as it is a significant source of protein, minerals, and vitamins for the rural poor who have limited access to protein from animal sources such as meat and fish (Therese *et al.*, 2019). The cowpea plant is a drought-tolerant food crop, well adapted to a diverse range of climate and soil types, and widely cultivated throughout the tropics and subtropics of Africa, Latin America, and Southeast Asia, as well as in the United States (Appiah, 2011). Cowpea is very palatable, highly nutritious and relatively free of metabolites and other toxins and provides an inexpensive source of dietary protein (Jimoh, 2017). It is among the major cash and food crops in Africa, Nigeria inclusive,





given the fact that they mature early on as little as 300 mm of rain, thereby reducing farmers exposure to yield risk and serve as an inexpensive source of protein and income especially for urban and poor rural dwellers. Beyond its nutritional value, cowpea has a high potential for rural development because of combination of benefits it offers.

In Nigeria, the predominant colours of cowpea are white, brown, and a combination of white and brown with a mottled appearance (Kehinde, 2016). The preferences of consumer are used mainly to refer to choose a choice that has the largest expected value among many choices by consumer to fulfill her or his desires or requirements. Consumer preferences vary for different varieties of cowpea in terms of seed size, colour, texture of seed coat, and taste among others in various part of the world. For instance, Ghanaians are willing to pay a premium for black-eyed peas, while Cameroonians would lower their prices for them. Even in Nigeria, consumers exhibit different level of preferences for the available cowpea varieties in the market (Mundua, 2010). According to David (2018), consumer preference is defined as the subjective tastes of individual consumers, measured by their satisfaction with those items after they've purchased them. This satisfaction is often referred to as utility. Consumer value can be determined by how consumer utility compares between different items. Consumer preferences can be measured by their satisfaction with a specific item, compared to the opportunity cost of that item since whenever you buy one item; you forfeit the opportunity to buy a competing item.

According to IITA (2017), cowpea is a food and animal feed crop grown in the semiarid tropics covering Africa, Asia, Europe, the United States, and Central and South America. The grains contain 25% protein and several vitamins and minerals. The plant tolerates drought, performs well in a wide variety of soils, and being a legume replenishes low fertility soils when roots are left to decay. It is grown mainly by small-scale farmers in developing regions where it is often cultivated with other crops as it tolerates shade. It also grows and covers the ground quickly, preventing erosion. Cowpea's high protein content, its adaptability to different types of soil and intercropping systems, its resistance to drought, and its ability to improve soil fertility and prevent erosion makes it an important economic crop in many developing regions. The sale of the stems and leaves as animal feed during the dry season also provides a vital income for farmers. All parts of cowpea crop are used as all are rich in nutrients and fibre. In Africa, humans consume the young leaves, immature pods, immature seeds, and the mature dried seeds. The stems, leaves, and vines serve as animal feed and are often stored for use during the dry season. Fifty-two percent of Africa's production is used for food, 13% as animal feed, 10% for seeds, 9% for other uses, and 16% is wasted (IITA, 2017). Furthermore, regional preferences occur for the different seed size, color texture of seed coat. More than 4 million tons of peas of all sorts are consumed worldwide, with 387,000 tons consumed in Africa. The demand for cowpea in Nigeria is driven by its large population of over 180 million people with an average growth rate of 2.57 per annum (IITA, 2015). Since the 1980s, the increased demand for cowpea has reportedly led to the cultivation of cowpea as a sole crop in many parts of the country (Wakili, 2013).

Fried cowpea cake (*Kosai, Akara*) is popular food in Nigeria and other West African Countries and form part of the diet for most ethnic groups in Nigeria (Ogundele, 2014). Nigerians usually eat it as breakfast with *ogi*, or lunch with garri or even dinner with eko. *Akara* is a traditional African food made by deep frying cowpea paste that has been whipped and seasoning with salt, pepper, onions and other optional ingredients. The outer crust of akara is crisp and the interior is spongy like bread. It is considered to be the most commonly consumed cowpea-based food in West Africa (Henshaw and Lawal, 1993; Asare *et al.*, 2013). *Akara* is





made mainly from cowpea and other sources like maize. Seeds of cowpea can be cooked in the dried form, sprouted or ground into flour in intermediate product. Being in the class of legumes, they are often referred to as poor man's meat 'due to their use as primary protein sources (Henshaw and Sobowale, 1996; Odedeji and Oyeleke, 2011). It is an important dietary staple in West African countries because of its high nutritional value, low cost and broad availability in the region. Cowpea soup is a heartwarming, beautiful, hearty, full-flavoured soup. This soup is an innovative recipe, based on Africa. Cowpeas are consumed regularly in virtually every household in West Africa. Although some cowpeas are purchased as green pods at harvest time and in some regions the leaves are eaten as greens, the majority of cowpeas are sold as grain in bulk form (FAO, 2018). Dominant improved varieties of cowpea grown in Nigeria include, genetically modified (GMO) cowpea, SAMPEA 20-T, IT97K-499-35, IT89KD-288, IT90K-277-2, IT89KD- 391, and IT98K-205-8 (ICRISAT, 2011). Although these varieties become difficult to identify by their code varietal names when they reach markets, they have however been categorized in line with their popular local names such as kwankwasiya, Kanannado fari, silver, Jan wake, yaro da kokari, 'yar camaru, rienna, BSADP, (2019). Others include, Olo-1, Olo-2, Banjara, karadua, Manyan fari, kanannado yar, akidi, Ife-brown, Oloyin, drum, milk, Sokoto amongst others (Afolami, 2002; Oyewale, 2016; Kassali et al., 2018; Ojedokun, 2020).

The different varieties are thus demanded by households for different purposes based on the forms in which they are utilized (Mundua, 2010; Oyewale, 2016). Cowpea are consumed in many forms either through direct cooking of cowpeas, processing into fried cowpea cakes, cowpea pudding, cowpea dumplings, cowpea porridges, cowpea stew among others based on the norms and values of how different groups of people can processed it. A lot of research (Jimoh, (2017); Ojedokun, (2020); Kassali *et al.*, (2018); Mundua, (2010); Hannah, (2013); Agbogidi (2012); Faith *et al.*, (2011); Kyari (2018); Katanga (2015) has gone into the development of improved cowpeas varieties and marketing in Nigeria, but the nature of consumer's preferences for cowpeas is yet to be ascertained to guide any future line of actions for producers, and more importantly the consumers.

The broad objective of the study was to examine the households' preference and usage of cowpea-based products and varieties in western zone of Bauchi State. However, the specific objectives were to:

- i. Describe the level of preference for cowpea-based products among households'
- ii. Determine factors influencing consumption preference for cowpea varieties among households.
- iii. Describe the constraints associated with cowpea consumption among households.

MATERIALS AND METHODS

The Study Area

The research was conducted in two local governments from western zone of Bauchi State, namely: Dass and Bauchi, Bauchi State, Nigeria. It occupies a total land area of 49,119 km² (18,965 sq. mi) representing about 5.3% of Nigeria's total land mass. It is located between latitudes 9° 3' and 12° 3' north and longitudes 8° 50' and 11° east. According to National Population Commission (NPC, 2006), the population of Bauchi State was 4, 476, 465 segregated to 2, 426, 215 males and 2, 250, 250 females and according to the National Bureau of statistics (NBS, 2019) with recent increase in the rate of population growth (3.5% per annum) the study area has a total of 7, 057, 045 people both males and females. Most of the people of Bauchi State engage in crop, livestock, fisheries productions etc. either in mixed farming or specifics are their dependable occupation.





Sampling Procedure

Multi-stage sampling procedure were employed in the selection of households. In the first stage, two local government areas were purposively selected from western zone. This is based on the prevalence of cowpea producers and consumers in the area. In the second stage, 3 communities will be randomly selected from each of the local government area, given a total of 6 communities across the zone. In the third stage, from each of the communities selected, 210 households were proportionately (8%) selected to give the households for the study.

Method of Data Collection

Primary data were collected using structured questionnaire administered to 210 households' heads or their representatives with the help of well-trained enumerator's.

Method of Data Analysis

The descriptive statistics was used to describe the level of preference for cowpea- based products and constrains to cowpea consumption among households. Multinomial logistic regression model was used to determine the factors influencing consumption preference for cowpea varieties among households. Consumption preference for cowpea varieties was considered as an outcome variable that has four categories whereas the socio-economic characteristics of household heads and reasons for preference for the cowpea varieties and its products were utilized as predictors in this study.

Kwankwasiya is the reference preferred cowpea variety for this study. The estimated coefficients measure the change in the logit for a one- unit change in the predictor variable while other explanatory variables are held constant. A positive estimated coefficient implies an increase in the likelihood that a household will prefer the alternative cowpea variety while a negative estimated coefficient indicates that there is less likelihood that a household will prefer an alternative cowpea variety (Ojedokun, 2020). As adopted by Jimoh (2017), the following model was used:

$$\begin{split} Y &= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} \\ &+ \beta_{12} X_{12} + \beta_{13} X_{13} + \beta_{14} X_{14} + \beta_{15} X_{15} + e & \dots (1) \\ \text{where:} \end{split}$$

Y = Consumption Preference for Cowpea Varieties; where Y = 1 (*Kwankwasiya*), Y = 2 (*Kanannado fari*), Y = 3 (*Silver*) Y = 4 (*Jan wake*)

 $X_1 = Age of the household head (in years)$

 $X_2 = Sex$ of the household head (dummy 1 = male, 0 = female)

 X_3 = Household size (No. of persons)

- X_4 = Marital status (dummy 1 = married, 0 = single)
- $X_5 =$ Educational level of household head
- X_6 = Occupation of household head
- X_7 = Household income (N)
- X_8 = Price of *Kwankwasiya* (\aleph)
- X_9 = Price of *Kanannado fari* (\mathbb{N})
- X_{10} = Price of *Silver* (\mathbb{N})
- X_{11} = Price of *Jan wake* (N)
- X_{12} = Time taken to cook
- X_{13} = Weevil damage tolerant (1 if tolerant to weevil damage, 0 if otherwise)
- X_{14} = Palatability (1 if palatable, 0 if otherwise)

 X_{15} = Taste (1 if taste is regarded as a factor in choosing preferred cowpea variety, 0 if otherwise)

 $\beta_1 - \beta_{15} = Coefficients$





 $\beta_0 = \text{constant};$ e = error term.

Key notes: *Kwankwasiya*: IT573-1-1, Silver: IAR 48 Improved variety, *Kanannado fari*: Local variety and *Jan wake*: SAMPEA 8 (IT93K-452-1).

RESULTS AND DISCUSSION

Level of Preference for cowpea-based products

Table 1 shows the distribution of households according to level of preference for cowpea-based products. The result revealed that the majority (75.7%) of households highly preferred *alale* and 41.9% preferred *kosai*, respectively. This result is in agreement with that of Ojedokun (2020) who reported that the commonest dishes prepared by households in Oyo State were moin-moin followed by akara. Sani et al. (2018) reveals that on large farms, male children and male adults were considered high adopters whereas female children and female adults were low adopters. In case of owners of medium size farms, both gender and age groups were low adopters. The result also indicated that there is a low preference for cowpea porridge (56.7%) of households. This is contrary with the study of Ojedokun (2020) who reported 75.6% of households in Oyo State mostly preferred cowpea porridge. The result also shows that 37.1% of the households moderately preferred cowpea soup while 48.6% slightly preferred dan wake. The result thus, revealed that the majority of the households highly preferred *alale* followed by kosai and other cowpea-based products. In that order, Lambot (2002) who reported that unlike other legumes, cowpea is multipurpose and as such different meals are prepared from it. The finding agrees with Okoronkwo (2020) who reported that beef is the most preferred meat consumed by households in the Umuahia metropolis in South-Eastern Nigeria.

Level of	Kosai	Alale	Cowpea	Cowpea	Dan wake
Preference			porridge	Soup	
Highly	88 (41.9)	149 (71.0)	20 (9.5)	65 (31.0)	25 (11.9)
Preferred					
Moderately	61 (29.0)	47 (22.4)	31 (14.8)	78 (37.1)	50 (23.8)
Preferred					
Slightly	37 (17.6)	4 (1.9)	119 (56.7)	64 (30.5)	102 (48.6)
Preferred					
Neutral	24 (11.4)	10 (4.8)	40 (19.0)	3 (1.4)	33 (15.7)

Table 1: Lev	el of preference	for cowpea-based	products among	households
	1	1		

Note: Figures in parentheses are percentages Source: Field Survey (2020).

Forms of Households' Usage of Cowpea Products Based on Varieties

Table 2 shows the distribution of households according to forms of usage of cowpea products according to cowpea varieties. The result revealed that most (52.3%) of households used the *kwankwasiya* cowpea variety to make *kosai*, 41.4% also used *kwankwasiya* variety to make *alale*, 42.4% of them used *Kanannado fari* to make cowpea porridge, 39.5% used *kwankwasiya* variety to make cowpea soup, 48.1% used silver variety to make *dan wake*, 53.3% used *Kanannado fari* variety to make rice and beans dishes, and 49.5% of them used *kwankwasiya* variety to make cowpea and spaghetti dishes, respectively.





Forms of Usage	Frequency	Percentage
Kosai		
Kwankwasiya	110	52.3
Kanannado fari	35	16.7
Silver	55	26.2
Jan wake	10	4.8
Alale		
Kwankwasiya	87	41.4
Kanannado fari	52	24.8
Silver	60	28.6
Jan wake	11	5.2
Cowpea porridge		
Kwankwasiya	45	21.4
Kanannado fari	89	42.4
Silver	50	23.8
Jan wake	26	12.4
Cowpea soup		
Kwankwasiya	83	39.5
Kanannado fari	70	33.3
Silver	48	22.9
Jan wake	9	4.3
Dan wake		
Kwankwasiya	67	31.9
Kanannado fari	40	19.0
Silver	101	48.1
Jan wake	2	1.0
Rice and beans		
Kwankwasiya	112	53.3
Kanannado fari	53	25.2
Silver	39	18.6
Jan wake	6	2.9
Cowpea and spaghetti		
Kwankwasiya	31	14.8
Kanannado fari	104	49.5
Silver	57	27.1
Jan wake	18	8.6

Table 2: Forms of usage for cowpea products based on varieties (n = 210)

Source: Field Survey (2020).

The results thus revealed that households mostly used *kwankwasiya* cowpea variety for their different dishes. The implication of this result is that the higher the number of dishes prepared from cowpea, the higher will be the magnitude of cowpea that will be needed by the households. This agrees with that of Michael (2016), Opoola (2016), Oyewale (2016) and Ojedokun (2020) who all reported that different varieties of cowpea are used in making different forms or products based on the preference of consumers.

Consumption preference for cowpea varieties by households

The result of households' consumption preference for cowpea varieties as shown in Table 3 revealed that 35.7% of the households mostly preferred *kwankwasiya* variety over other varieties, 34.3% of the households preferred *Kanannado fari* variety over other varieties,





23.8% mostly preferred the *silver* variety over others and 6.2% mostly preferred *Jan wake* variety over other varieties. The result thus revealed that the majority (35.7%) of households that mostly preferred *kwankwasiya* variety, they did so because of its palatability, easy to processed, short time to cooked and ability to withstands weevil infestation. The result also showed that 34.3% of households mostly preferred *Kanannado fari* because of its size, taste and ability to tolerate weevil infestation respectively. Also, the result revealed that the households that mostly preferred silver variety did so because of its taste, palatability, takes less time to cook and ability to tolerate weevil infestation. Finally, the result showed that the households that mostly preferred *Jan wake* preferred it because of its taste and ability to withstand weevil infestation. These results confirm the findings of Murdock *et al.* (2003), Faye *et al.* (2006) and Ojedokun (2020) who all reported that consumers are generally understood to prefer cowpeas with less insect damage and with high sucrose contents and less cooking time.

Tuble 9: Consumption preference for cowpea varieties by nousehold neads			
Preferred variety	Frequency	Percentage	
Kwankwasiya	75	35.7	
Kanannado fari	72	34.3	
Silver	50	23.8	
Jan wake	13	6.2	
Total	210	100.0	

Table 3: Consumption preference for cowpea varieties by household heads

Source: Field Survey (2020)

Factors Influencing Household Consumption Preference for the Selected Cowpea Varieties

In using multinomial logit regression analysis, Table 4 revealed that the log-likelihood function of factors influencing households' consumption preference for the selected cowpea varieties was -208.59, the pseudo R^2 was 0.2001 and that the entire model was significant at the (P<0.01) level. These diagnostic variables and the significance level reveal the fitness of the entire model. The result revealed that out of the socio- economic variables considered; only age, educational level, occupation and income of the household heads significantly influenced households' preference for cowpea varieties. The result has also shown that time taken to cook, taste, and ability to tolerate weevil infestation were the significant reasons that influenced households' preference for cowpea varieties.

Also, the coefficient of age was positive and statistically significant at (P<0.05) which means that older household heads relative to younger ones will more likely prefer *kanannado fari* variety as their main cowpea variety as compared with *kwankwasiya* variety. This implies that an increase in the age of household head by 1 year will increase their likelihood of preferring *kanannado fari* variety as their main cowpea variety by 8.11%. This result is similar to Ojedokun (2020) who in his study found that older household head as compared to younger household head will more likely prefer *drum* as their main cowpea variety than any other variety. The result also shows that the coefficient of educational level was positively significant at (P<0.1) which indicated that an increase in the years of education by 1 year would increases households' preference for *Kanannado fari* by 5.40% relative to *kwankwasiya* variety as their main cowpea variety. This implies that those who spent fewer years in attaining formal education would not prefer the *kwankwasiya* variety as their main cowpea variety. This result is in line to that of Abdul-latif and Ayob (2017) who found a positive relationship between years of education and preference for foreign rice. Contrary to that, Ojedokun (2020) in his





study found an inversely relationship between years of education and households' preference for *Oloyin* cowpea variety in Oyo State.

The result also revealed that the average household head monthly income was positively significant at (P<0.1) with a coefficient of 0.3876. This implies that for a unit increase in the monthly income of the household head, the probability of preferring *kanannado fari* variety will increase by 38.76% as compared with *kwankwasiya* variety as the main cowpea variety. This is contrary to the study of Muhammad (2017) who found a negative relationship between income and household preference for local rice in Bauchi State. The result further revealed that the coefficient of price of *kwankwasiya* variety was positive and statistically significant at (P<0.05) which indicates that an increase in the price of *kwankwasiya* by \$1 would increase the likelihood of household preference for the variety by 372%.

The result further showed that the coefficient of price of silver was negative and statistically significant at (P<0.01) which means that an increase in the price of silver variety by \$1 would decrease household preference for *kanannado fari* variety by 391.7%. The result also revealed that the coefficient of time to cook was positive and statistically significant at (P<0.1) which means that an increase in the time of cooking of *kanannado fari* variety would increase households' preference for *kanannado fari* variety by 6.17%. The result is contrary with the findings of Ojedokun (2020) who reported no relationship between time to cook and household preference for cowpea varieties. Finally, the result revealed that the coefficient of weevil damage tolerance of *kanannado fari* would increase households' likelihood of preferring *kanannado fari* as their main cowpea variety as compared with *kwankwasiya* variety. This implies that an increase in the ability of *kanannado fari* variety to tolerate weevil infestation would increase households' preference for the variety as 100%.

The result also showed that the coefficient of the age of the household head was positive and statistically significant at (P<0.01) which means that older household heads as compared to younger household heads will more likely prefer silver as their main cowpea variety relative to *kwankwasiya* variety. This implies that an increase in the age of the household head by 1 year will increase their likelihood of preferring silver as their main variety by 2.76%. This result is in line with Ojedokun (2020) who in his study pointed out that older household head would prefer *Drum* cowpea variety as compared to the younger household heads in Oyo State. This is also similar to that of Mlanga (2010) who in his study on rice reported that young consumers are more likely to choose high-quality rice varieties over other rice varieties. The educational level was found to be positive and statistically significant at (P<0.05) which indicates that the likelihood of household preference for silver variety will tend to increase by 64.62%. This in line with Emodi and Madukwe (2011) who noted that most of the household heads with high level of education preferred imported rice because of its high quality.





Variables	Kanannado	Silver	Jan wake
	fari		
Constant	-2.9338	6.8829***	-11.2944
	(0.397)	(0.003)	(0.281)
Age	0.0811**	0.0276***	0.0097
C	(0.027)	(0.003)	(0.800)
Sex	-0.0263	-0.0349	-1.2563
	(0.953)	(0.579)	(0.217)
Household size	-0.1122	0.0171	0.0208
	(0.168)	(0.800)	(0.706)
Marital status	0.0500	0.0423	-1.6606
	(0.802)	(0.603)	(0.877)
Educational level	0.0540*	0.6462**	-0.1312
	(0.087)	(0.47)	(0.512)
Occupation	-0.0085	0.0279	-0.0026*
	(0.336)	(0.353)	(0.089)
Income	0.3876*	1.2556	-0.1242*
	(0.097)	(0.151)	(0.074)
Price of Kwankwasiya	3.7202**	0.1677	-0.2844
	(0.047)	(0.505)	(0.659)
Price of kanannado fari	-0.0709	-2.3441**	-0.2329***
	(0.742)	(0.035)	(0.000)
Price of silver	-3.9170***	-0.1337	-0.2211
	(0.002)	(0.633)	(0.730)
Price of Jan wake	0.0639	-0.2448*	-0.5804***
	(0.728)	(0.095)	(0.004)
Time taken to cook	0.0617*	0.3304	0.4972
	(0.062)	(0.293)	(0.507)
Taste	0.1476	0.6578**	0.7332
	(0.278)	(0.021)	(0.302)
Palatability	-0.1122	-0.5021	0.4107
	(0.168)	(0.115)	(0.657)
Weevil tolerance	0.1810**	0.1677	0.8010
	(0.025)	(0.505)	(0.497)
Log likelihood: -208.5937			
Pseudo R-square: 0.2001			
Prob>chi-square: 0.0000			

Table 4: Factors influencing households' consumption preference for cowpea varietiesVariablesKanannadoSilverJan wake

*, ** and *** = Significant level at (p<0.1), (p<0.05) and (p<0.01); Figures in parentheses are the Z-values Source: Field Survey (2020).

The result Table 4 showed that the coefficient of prices of silver and Jan wake variety were negatively significant at (P<0.05) and (P<0.1), respectively, which indicates that if the prices of silver and *Jan wake* increases, households will less likely prefer silver and *Jan wake* as their main cowpea variety and their reference category is *kwankwasiya* variety. The result of Table 4 further shows that taste was positively significant at (P<0.05) with coefficient of 0.6578, which implies that those household head that consider taste were about 65.78% times more likely to prefer silver variety as their main cowpea variety relative to *kwankwasiya* variety. This result is in line with the study of Muhammad (2017) who reported that households consider taste as a factor for preferring local rice in Bauchi state. Moreover, the result indicated





that the coefficient of occupation was negatively significant at (P<0.1) with coefficient of 0.0026 which implies that households headed by a civil servant will less likely prefer the *Jan wake* variety of cowpea as their main cowpea variety as compared with *kwankwasiya* variety. This result is similar to that of Ojedokun (2020) who reported that civil servant will less likely prefer *Sokoto* variety of cowpea as their main cowpea variety. The result further implies that a change in the main occupation of the household heads from civil servants to other occupations would reduce households' preference for the *Jan wake* variety by 0.26%. This could be due to the fact that those salary earners have a high tendency to acquire nutritionally related knowledge which in most cases influences their foods consumption pattern (Ogundele, 2014; Ojedokun, 2020).

The results also revealed the coefficient of income of the household head was negatively significant at (P<0.1) which means that households' will less likely prefer *Jan wake* variety as their main cowpea variety as their income increases. This implies that an increase in the income of the household head by $\mathbb{N}1$ would reduce households' preference for the *Jan wake* variety by 12.42%. The result also showed the coefficient of the price of *Kanannado fari* was negatively significant at (P<0.01) which implies that an increase in the price of *Kanannado fari* would reduce the likelihood of households' preferring *Jan wake* as their main cowpea variety relative to *kwankwasiya* variety. This also implies that an increase in the price of *Kanannado fari* by $\mathbb{N}1$ would reduce the likelihood of household preferring *Jan wake* by 23.29%. Finally, the result revealed that the coefficient of the price of *Jan wake* variety was negatively significant at (P<0.01) which shows that as price of *Jan wake* variety increases, the likelihood of households' preferring *Jan wake* variety would decrease relative to *kwankwasiya* variety. This implies that an increase in the price of *Jan wake* variety significant at (P<0.01) which shows that as price of *Jan wake* variety increases, the likelihood of households' preferring *Jan wake* variety increases, the likelihood of households' preferring *Jan wake* variety increases, the likelihood of households' preferring *Jan wake* variety increases, the likelihood of households' preferring *Jan wake* variety would decrease relative to *kwankwasiya* variety. This implies that an increase in the price of *Jan wake* variety would decrease relative to *kwankwasiya* variety. This implies that an increase in the price of *Jan wake* variety by $\mathbb{N}1$ would decrease households' preference for *Jan wake* by 58.04%.

Constraints to Households' Preference for Cowpea Consumption

Table 5 shows the distribution of households according to constraints to households' preference for cowpea consumption in the study area. The result revealed that the major challenges that affect the household's consumption preference for cowpea and its products were high cost of cowpea (97.1%), insect infestation (81.4%), abdominal discomfort (70.0%), poor storage of grains at home (69.0%), long time in cooking (30.5%), unavailable all year round (24.3%) and difficulty in processing (15.2%). The result is similar to that of Muhammad, (2017) who reported that high cost of the rice, poor quality, difficulty in processing as well as adulterated products were the major challenges that affect the household's consumption preference of local and imported rice in Bauchi State. The results are in collaboration with Saleh *et al.* (2016) revealed that, cost of shelled groundnut constituted the major (92.3% and 91.6%) components of processing costs for RMP-12 and Ex-dakar respectively, and that major impediments of modern groundnut oil processing were security challenges, costs of inputs, inadequate capital, and erratic power supply.





Constraints	SA	Α	*Frequency	Percentage	
High cost of cowpea	143	61	204	97.1	
Insect infestation	94	77	171	81.4	
Abdominal discomfort	52	95	147	70.0	
Poor storage of grains	31	114	145	69.0	
Long time in cooking	9	55	64	30.5	
Unavailable all year round	9	42	51	24.3	
Difficulty in processing	7	25	32	15.2	

 Table 6: Constraints to households' preference for cowpea consumption

*Multiple responses were recorded

Source: Field Survey (2020).

SA= strongly agreed, A= Agreed

CONCLUSION AND RECOMMENDATIONS

Based on the findings of this study, it can be concluded that most of the households highly preferred *alale* as cowpea-based products and used *kwankwasiya* cowpea variety to make their dishes. Age, educational level, occupation, income, prices of cowpea varieties, time of cooking, taste and weevil damage tolerance were statistically significant in determining the factors influencing households' consumption preference for cowpea varieties. Major constraints to households' preference for cowpea consumption include high cost of cowpea, insect infestation, abdominal discomfort and poor storage of grains. If those aforementioned constraints were tackled, it will help boost the consumption of cowpea and its based products. Based on the findings of this study, it was recommended that:

- 1. Effort should be made by stakeholders and breeding institutions to create policies that would be favourable to control the menace of price fluctuations of cowpeas.
- 2. Cowpea farmers should divert more resources to the production of *kwankwasiya* cowpea variety so that they can meet consumer demand and increase their level of income.

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