Willingness to Pay for Local Ready-to-Use Therapeutic Food for Malnutrition Management in Bungoma and Busia Counties, Kenya

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Abstract

Cases of malnutrition have been on the rise in Western Kenya inhibiting the development of the region. Among the coping strategies for malnutrition is the introduction of Ready-to-Use Therapeutic Foods (RUTF). These are energy-dense pastes which have nutritional values as they are made from powder milk, peanuts, minerals, sugar, vitamins and vegetable oils. Despite this invention, the communities have been facing challenges in terms of access to RUTF. This is due to shortages in stock of RUTF as they are on high demand. The available products are usually imported and primarily distributed in hospitals as donations and no major commercialization effort of the product has been done. This leaves the product to be only limited to the beneficiaries of the donations and any other willing consumer of the product cannot access it. The study therefore sought to determine the consumers' willingness to pay for an alternative local RUTF in Western Kenya. A face-to-face household- level survey of 400 respondents chosen through multistage sampling was conducted in Busia and Bungoma counties of Western Kenya. A structured questionnaire and both descriptive and econometric analysis were employed. Estimations of the factors affecting the consumers' willingness to pay were conducted using binary logic model. The results show that majority of the respondents (252 out of 400 accounting for 63%) were willing to pay for a local RUTFs. The binary logistic regression results showed that frequency of consumption of RUTFs was found to positively influence the willingness to pay (WTP) while household size and land tenure negatively and significantly affected WTP. The high ratio of willingness to pay reveals the importance of producing a local alternative RUTFs to meet the demand. Household socio- economic characteristics also played an essential role in influencing the willingness to pay and should be considered when producing an alternative RUTF.
Key words: *TVET, Social entrepreneurship, volunteerism*

Introduction

Malnutrition is one of the greatest pandemic in Kenya affecting a great part of the population with an estimate of about 10 million people suffering from food insecurity and poor nutrition (Kwena, 2016).This is especially the case for low income households who form a majority of the population in Kenya (Klasen, 2014). In Western Kenya, the increasing population due to high birth rate has led to creation of smallholder households. These smallholder households usually face limitations in terms of accessing productive capital, resources, technology and lack the bargaining power for fair prices at the market. According to KNBS (2010), 60%

of the population in Western Kenya is living below the rural poverty line. This depicts a significant worrying trend as most of the population is unable to afford a daily nutritious balanced diet. Among the implications of malnutrition are: death of expectant women during childbirth or giving birth to underweight babies with slim chances of surviving infancy (Law et al., 2001).

One of the coping strategies that has been introduced to curb malnutrition is the use of Ready-to-use therapeutic food (RUTF). These are energy dense, micronutrient enhanced pastes used in providing essential nutrients needed for malnutrition management (Dibari, El Hadji, Collins & Seal, 2012).

Globally, the demand for RUTF has been steadily increasing yearly. UNICEF, who is the major supplier, started procuring RUTF in 2000. The demand has been furthered by the endorsement of a community-based management approach to acute malnutrition in 2007 by WHO, WFP, UNICEF and the United Nations System Standing Committee on Nutrition (UNSSCN) and the increasing number of pilot programmes (WHO & UNSCN, 2007). By 2016, UNICEF's demand for RUTF stood at 34,000 million tonnes with 13,403 million tonnes accounting for East and South Africa (UNICEF, 2016). This high demand is representative of treatment of more than 2 million children in 47 countries caused by recent emergencies and greater programmatic acceptance (Wagh & Deore, 2014). Despite these volumes, current supply through UNICEF only covers 10% of the estimated global caseload of malnutrition (Wagh & Deore, 2014). Currently, UNICEF's priority is to identify manufacturers in Sub Saharan Africa countries where RUTF is mostly used (UNICEF, 2016). Western Kenya is one of the areas in Sub Saharan Africa where the problem of severe malnutrition persists (Kwena. 2016). As a result of challenges experienced when accessing the RUTF such as shortages, most people in Western Kenya are unable to access the products. The fact that most of the existing RUTF are the donations supplied to regional hospitals and urban centers makes it difficult for members of the community in Western Kenya who live in the rural areas as they have to travel long distances and incur transportation costs (Nagata, et al., 2014). Typical primary ingredients that constitute RUTF include oil, palm, soy peanuts, sugar, whey powder, milk powder and vitamin and mineral supplements (Dibari, El Hadji, Collins, & Seal, 2012). Most of these components grow well in Western Kenya. This calls for an alternative therapy to malnutrition by producing a local RUTF. However, to produce a demand driven product that will appeal to the consumers, there is needed to determine their acceptability and willingness to pay. This has prompted this research that sought to determine whether the people of Western Kenya would be willing to pay in case a local RUTF is produced that would be easily accessible to the locals.

Methodology

The study was conducted in Busia and Bungoma Counties of Western Kenya targeting consumers who were accessing RUTF from the Teso North Hospital and Bungoma County Referral Hospital. Most of these consumers were severely to moderately malnourished patients and children who were suffering from ailments

that were directly associated with malnutrition such as HIV/AIDs and tuberculosis. For the case of children, their parents responded to the research questions on their behalf. Multi-stage sampling procedure was used in the selection of representative sample. The first step involved purposive selection of Bungoma and Busia counties due to prevalence of malnutrition in the area. Secondly, groups of respondents who were consumers of RUTF were randomly selected using simple random sampling from a database list accessed from records of beneficiaries of RUTF in Bungoma County referral Hospital in Bungoma and Teso North Hospital in Busia. The required sample size was determined by using the Krejcie and Morgan table on sample size selection (Krejcie & Morgan, 1970) which uses the formula:

$$S = \frac{X^2 NP(1-P)}{d^2(N-1) + X^2 P(1-P)}$$

Where:

S = Required Sample size, X = Z value (1.96 for 95% confidence level), N =Population Size, P= Population proportion (assumed to be 50%) and d = Degree of accuracy (5%), expressed as a proportion (.05).

This resulted in a sample population of 351 respondents and was however adjusted to 400 with an equal 200 from each county to give an equal proportion and increase the R-squared value.

Descriptive and econometric analysis was used for the collected data using Statistical Package for Social Sciences (SPSS). Descriptive statistics such as means, minimum and maximum values, frequencies, percentages and standard deviations were used to describe and examine respondents' socio-economic factors determining the use of RUTF. To analyze the factors affecting the WTP for RUTF, a binary logit model was used.

$$Y(0,1) = \beta 0 + \beta 1 X1 + \beta 2 X2 + \ldots + \beta n Xn + \varepsilon$$

Where :Y (0, 1) =Willing to pay (1) or Not Willing to pay (0), X1=Gender, X2= Age, X3=Land holding, X4=Land tenure, X5=Education Level, X6=Marital status, X7=Monthly income, X8=Household size, X9=Farm income,X10= Frequency of consumption of RUTF, X11=distance to RUTF dissémination centres affect the Willingness to pay for a RUTF and ε is the error term.

Results

Socio-Economic Characteristics of the Respondents

From the results, it was quite evident that majority of the respondents who participated in the study were females represented by 56.8% and followed by males at 43.2%. This could imply that the issue of malnutrition in Western Kenya largely affects females. The results of the respondents' demographic background are presented in Table 1

The highest proportion of the respondents, 46.9%, was within the age bracket of 19-35. The remaining 53.1% was shared among respondents of age brackets less than 18 (7.4%), 36-50 (25.9%) and greater than 50 (19.8%). Those who practiced farming as their primary occupation stood at 32.1%. The remaining 67.9% were distributed between those who were housewives, casual workers, small scale business, large scale business and those who had formal employment at 8.6%, 18.5%, 28.4%, 2.5% and 9.9% respectively. Results from the type of land tenure show that most of the respondents (28.4%) acquired their land through inheritance. The remaining 71.6% shared between those who had title at 24.7%, without title at 16.0%, leased 19.8%, and communal land at 11.1%.

Table 1 *Socio-economic Characteristics of Respondents (Discrete Variables)*

Variable		Frequency	%
Marital Status	Single	124	30.9
	Married	84	21.0
	Widowed	74	18.5
	Separated/Divorced	118	29.6
Respondent Age	Less Than 18	30	7.4
	19-35	188	46.9
	36-50	104	25.9
	Greater Than 50	78	19.8
Level Of Education	No Formal Education	30	7.4
	Primary	208	51.9
	Secondary	133	33.3
	Tertiary	20	4.9
	University	9	2.5
Land Tenure	With Title	99	24.7
	Without Title	64	16.0
	Leased	79	19.8
	Inherited	114	28.4
	Communal	44	11.1
Household Head Occupation	Housewife	34	8.6
	Casual Worker	74	18.5
	Small Scale Business	114	28.4
	Large Scale Business	10	2.5
	Farmer	128	32.1
	Formal Employment	40	9.9
Level of Income	KShs 10,000	252	63.0
	Ksh10,001–Ksh25,000	124	30.9
	Ksh25,001–Ksh50,000	15	3.7
	> Ksh75,000	10	2.4

Results of the marital status of the household head indicated that majority of the respondents; 30.9% were single, closely followed by those who were separate/ divorced with 29.6%. At third were the ones who were married who accounted for 21% and finally the widowed who stood at 18.5%. The results of the education level of the respondents indicated that majority of them had reached primary school level at 51.9%, 33.3% had furthered on to secondary school, 7.4% never attended any formal school, 4.9% reached tertiary school while a mere 2.5% reached University. Majority of the respondents at 63% earned an income of below Ksh 10,000 per month. The respondents earning between Ksh 10,001 and Ksh 25,000 accounted for 30.9%. The proportion of respondents kept on decreasing with increasing income level with 3.7% of the respondents earning between Ksh 25,001 and Ksh 50,000 while only 2.5% of the respondents earning above Ksh 50,000 per month.

Table 2 *Socio-economic Characteristics of Respondents (Continuous Variables)*

	N	Min	Max	Mean	Std. Deviation
Total Land Holding	81	.00	6.00	1.92	1.41
Total Household Members	81	1.00	22.00	7.59	4.73
Log Total Income	81	.00	5	2	0.63

The total land holding of the respondents had an overall mean of 1.9 acres indicating the existence of smallholder farmers. The maximum land size was found to be 6 acres while some respondents did not own land as shown in Table 2 above. The average household size was composed of 7 members with some households recording a maximum of 22 members showing a prevalence of large population in relation to the small land holdings. The average annual income from farming stood at Ksh 12752 translating to a monthly income of Ksh 1063.

Logit Model Results

Model summary and dagnostic tests results.

With a Nagelkerke square of 0.887 and Cox and Snell R square value of 0.655, the model explains between 65.5% and 88% of the variability of the response data around its mean. The normality test results of the data set indicated that the data was normal as the significance of the Shapiro-Wilk's W test was greater than 0.05.The Hosmer and Lemeshow test of goodness of fit suggests the model is a good fit to the data as p=0.982(>0.05)

Table 3 *Model Summary*

Cox and Snell R Square	Nagelkerke R Square	Shapiro-Wilk's W test			Hosmer and Lemeshow Test
		Statistic	*df*	*Sig*	
.655	.887	0.756	81	0.062	0.982

Factors affecting cconsumers' willingness to pay. The results of the Logit Model show that the age of respondent (p <0.10), land tenure (p <0.10), monthly income (p <0.10), size of household (p <0.10) and total income from farming (p <0.10). Frequency of consumption of RUTF (p <0.10) were significantly affecting the willingness to pay for RUTF as shown in Table 4. The total and income from farming is attributed to the fact that a farmer who has a high income will be able to afford to purchase the RUTF. The frequency of consumption might be attributed to the fact that the respondents felt the pinch of spending on the already available RUTF and would opt for an alternative that favours them financially.

	B	S.E.	Sig.	Exp (B)
Gender	-1.374	1.653	.406	.253
Age	2.792	1.573	.076	16.308
Land Holding	-.909	.595	.127	.403
Land Tenure	-1.543	.776	.047*	.214
Education Level	1.820	1.323	.169	6.173
Marital status	1.624	1.041	.119	5.074
Monthly Income	1.640	.926	.076	5.158
Household Size	-2.089	.913	.022*	.124
Farm Income	.000	.000	.054	1.000
Frequency	3.587	1.744	.040*	36.125
Distance	-.063	.039	.102	.939
Constant	-9.729	8.594	.258	.000

*, **: significant at 5% and 1% level respectively

Household size was found to be significant and negatively influenced the willingness to pay for locally produced RUTF. This negative relationship was

attributed to the increase in financial constraints that comes with a large household hence discouraging the purchase of RUTFs. Similar results were reported by Bett, Peters, Nwankwo, and Bokelmann (2013) in the analysis of consumer preferences and willingness to pay for underutilized indigenous chicken products. Similarly, a study by Owusu (2009) in Kumasi - Ghana showed that household size significantly influence consumers' WTP for organic fruits and vegetables.

Results from the type of land tenure show that most of the respondents at 28.4% acquired their land through inheritance. The remaining 71.6% shared between those who had title were 24.7%, without title at 16.0%, leased at 19.8%, and communal land at 11.1%. The land tenure was found to be significant at 5%. With a high percentage of the respondents owning land meant that money which would have been used to pay rent is now at their disposal to pay for RUTFs. On the contrary, it also shows the inability of most of the respondents to purchase new lands. This creates a concern and a future worrying trend considering the increase in population leading to more land division and emergence of small holder farms as generations pass. This would later translate to inability to own asset and subsequently the inability to pay. These findings are similar with those of Rohith &Chandrakanth (2011), and Mezgebo Tessema and Asfaw (2013). These results also coincide with a study by Akter (2006) on factors affecting the willingness to pay for crop insurance in rain-fed areas. His results indicated that economic status such as land size, land tenure and household assets highly affected the willingness to pay. The frequency of consumption of RUTF was found to significantly and positively influence the willingness to pay for an alternative RUTF at 5% level of significance. This can be attributed to the fact that those respondents who used RUTF more frequently knew the importance of RUTF and saw an option for an alternative as a reprieve to the challenges they had been experiencing in accessing RUTF. Consistent findings to these results were found by Alemayehu (2014); and Ogunniyi, Sanusi & Ezekiel (2011); Wendimu & Bekele (2011), who found a positive relationship between frequency of utilization and willingness to pay.

Conclusion

The aim of the study was to determine the willingness to pay for RUTFs and factors influencing the willingness to pay for RUTF. Majority (63%) of the respondents were willing to pay for RUTF while 37% were not willing to pay. The higher ratio of willingness to pay reveals the importance of producing a local alternative RUTF as there is ready demand. The findings also revealed that household socio-economic characteristics play an essential role in influencing the willingness to pay for RUTF. Age, Income from farming, frequency of consumption of RUTF and total income were found to positively influence the WTP, while household size and land tenure negatively and significantly affected WTP. Household size had a negative influence because the more the household size, the more the strain on income and the less the disposable income to buy supplements. Age had a positive influence as increase in age led to more enlightenment on the importance of RUTF and the need to be health conscious.

Recommendations

The WTP analysis results show there is high demand for RUTF and therefore they provide strong evidence for the positive impact of RUTF as a potential avenue for alleviating malnutrition in Kenya. This calls for increased investments and policy support for increasing production to satisfy the demand and ultimately manage malnutrition. Furthermore, most of the ingredients used in production of RUTF thrive well in Western Kenya. This can create a marketing opportunity for the locals to the producers of RUTF and hence economically benefit the locals. The socio economic factors, specifically the land tenure, frequency of consumption and the household size should be considered when developing a marketing mix for the product.

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