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## Willingness-to-Pay for Halal and Branded Poultry in Northern Mozambique

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Willingness-to-Pay for Halal and Branded Poultry in Northern Mozambique

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## **ABSTRACT**

While price typically drives consumers' food purchasing decisions in low-income countries, religious attributes associated with food production and corporate branding could influence buying patterns. In Mozambique more than 46% of people were living below the poverty line of (\$0.31 USD) per day in 2018. That being said, in the Nampula Province (the location of this study), which is the second poorest province in the country, over 25% of the population is Muslim and may be willing-to-pay (WTP) a premium for Halal meat products to uphold Islamic beliefs. Like many parts of sub-Saharan Africa, poultry is the fastest growing source of protein. Since large-scale domestic poultry industries are relatively new in Mozambique, brand loyalty is a new concept that has not empirically analyzed before in the literature. In this study we survey 312 consumers in Nampula, Mozambique using a Choice Based Modeling approach to estimate if consumers are WTP for chicken which was slaughtered according to Halal laws and chicken which branded by New Horizons (the largest chicken producer in Nampula). The results of this study are important as they show if consumers in low-income countries are WTP a premium for branded commodities and if consumers are WTP for religious production attributes.

Following data collection using a researcher-developed survey instrument, logistic regression models were estimated using maximum-likelihood techniques to evaluate poultry-attribute preferences (independence was rejected). A random parameters logit (RPL) model estimated the mean and standard deviation associated with each attribute's effect on the probability of purchasing poultry. Marginal WTP values were computed with respect to the price coefficient.

Results of our sample could indicate that even in low-income countries like Mozambique, consumers are WTP a premium for branding. This would signal a need for further research in the

future to determine if these results are generalizable to countries with similar economic structure. In communities like Nampula, this branding could be a proxy for food safety concerns, and these results are important as in many low-income countries commodities (such as live/processed chickens) have no branding associated with them. Even in the poorest part of Mozambique, Muslims are WTP a premium for Halal produced meat. This should signal to meat producers to market appropriately (via the Halal logo) in order to increase market share and overall sales without the exploitation (via price increases) of consumers. Interestingly, across the sample Halal was not a signal for food safety or quality, it was viewed simply as a religious attribute. These data are applicable to a real-world problem; the study was built around a real company in Mozambique, and the data will be shared with New Horizons to improve marketing efforts and hopefully increase accessibility and education about commodity products in third-world countries.

## **INTRODUCTION AND LITERATURE REVIEW**

Mozambique has consistently battled poverty and food insecurity since its independence from Portugal in 1975. Despite governmental efforts to combat food insecurity and stimulate economic growth, Mozambique has continued to rank amongst the lowest in the world for per-capita gross domestic product (GDP) at \$1,300 (CIA, 2018). In holistic measurements of livelihoods, like the Human Development Index, Mozambique ranked 181 out of 188 countries in 2016 (UNDP, 2016). Food insecurity and prolonged poverty have created a binding budget constraint for most people in Mozambique to receive well-balanced, nutrient rich diets including fresh fruits and vegetables and specifically protein. Per capita consumption of animal protein in Mozambique is low, even relative to its region. Malnutrition throughout the country is largely related to lack of variation in the Mozambican diet; it mainly consists of cassava (Hansen, 2016).

With this current standard of living, it can be difficult for Mozambicans to meet the Recommended Dietary Allowance (RDA), which is defined as “average daily level of intake sufficient to meet the nutrient requirements of nearly all (97%-98%) healthy people” (Swanigan, 2019). The lack of diversity in a Mozambican’s diet can be attributed to many factors, including lack of basic infrastructure after the civil war and frequent natural disasters (Swanigan, 2019). These significant barriers have made accessing a holistic diet almost impossible for the average Mozambican; the additional factor of economic strife throughout the country has also contributed to the large number of people that are not able to meet the RDA of nutrients in a diet.

Like many African countries, religion in Mozambique is diverse and often dictated by geography. Mozambique as in its entirety is estimated to be 28% Catholic, 18% Muslim, 27% other Christian beliefs, 7% other beliefs and 18% non-affiliated (International Religious Freedom Report, 2018). The percentage of practicing Muslims is the highest along the coast of Northern Mozambique in the provinces of Nampula and Cabo Delgado. While the availability of poultry in Northern Mozambique has been cited as one way to combat food insecurity, specifically pertaining to protein deficiencies (FAO, 2013), under Islamic law meat must be slaughtered in the Halal tradition. While not a barrier to food security, Halal slaughtering could be seen as an impediment to achieving efficiency in food production.

According the United Nations Food and Agricultural Organization (FAO) the definition of Halal foods are: foods permitted under the Islamic Law and the following conditions: does not consist of or contain anything which is considered to be unlawful to Islamic Law; has not been prepared, processed, transported or stored using any appliance or facility that was not free from anything unlawful according to Islamic Law; and has not in the course of preparation, processing, transportation or storage been in contact with any food that fails to satisfy the

previously stated conditions (FAO, 1997). When battling food insecurity and protein deficiencies, these rules could pose a large cost for non-Halal producing protein facilities to produce both Halal and non-Halal foods. However; the FAO definition goes on to state that halal food can be prepared, processed or stored in different sections or lines within the same premises where non-Halal foods are produced, provided that necessary measures are taken to prevent any contact between halal and non-halal food. Further, halal food can be prepared, processed, transported or stored using facilities which have been previously used for non-halal foods provided that proper cleaning procedures, according to Islamic requirements, have been observed. Again, this would seem to imply that there would be additional costs to large scale protein (livestock and poultry) to produce Halal products, which could impede food security.

Specific to animal products, FAO states that when slaughtered; the person should be a Muslim who is mentally sound and knowledgeable of the Islamic slaughtering procedures; the animal to be slaughtered should be lawful according to Islamic law; the animal to be slaughtered should be alive or deemed to be alive at the time of slaughtering; the phrase “Bismillah” (In the Name of Allah) should be invoked immediately before the slaughter of each animal; the slaughtering device should be sharp and should not be lifted off the animal during the slaughter act; and the slaughter act should sever the trachea, esophagus and main arteries and veins of the neck region. While the actual slaughtering of an animal in the Halal manner is only a marginal cost it is still another impediment for comingling of non-Halal and Halal certified meat.

Halal food sector was estimated to have global sales of \$3.7 trillion USD in 2019 (Alternative Africa, 2017). It was estimated that in 2015 that Halal food accounted for 16% of value of the global food industry (SGS, 2015). Ironically, the largest exporters of Halal meat (Brazil, Australia and New Zealand) have small Muslim populations but have modern

slaughtering facilities and infrastructure to maintain identity preservation. Certification is an important building block in generating trust amongst consumers concerning the authenticity and reliability of halal products. A clear and standard approach to audit and certification, along with full awareness and transparency in terms of compliance requirements and expectations, allows the food industry to build a stable infrastructure, capable of meeting customer expectations. Unlike high-income countries which have high regulatory standards, many low-income countries have weak standards and even weaker monitoring systems for those standards.

While demand is growing for Halal meat globally, there are two binding factors in low-income countries which could hinder growth, identity preservation/cost of production (supply side) and low-incomes (demand side). Previous studies have shown that consumers in middle and low-income countries are WTP a premium for Halal meat (Nurrachmi, 2017). However; none of these previous studies have analyzed a market as poor as Northern Mozambique.

Branding for commodities, and specifically meat products, in open air African markets is still in its infancy due to lack of copyright law, lack of labeling, lack of monitoring and enforcement and lack of large-scale meat processors. The majority of rural Africans often find themselves searching for the cheapest food possible as the majority of their income goes to food purchases. This idea imposes an important question this study: are people willing to pay for branded commodity products? Given there is lack of food safety enforcement such as the FDA in the United States, branded food could serve as a proxy for food safety; playing the role of educating consumers on where their food comes from and how it was made.

In many low-income countries, large global retailers are appearing to be strong players in food marketing systems, offering greater efficiency and more options for consumers. Modern



food retailing options inevitably lead to new shopping patterns, but consumers in developing nations do not necessarily follow the food shopping and consumption behaviors seen in western nations (Veeck). One study notes the importance of smaller food retailers such as New Horizons (Polsa and Fan, 2011). The role this producer plays in the local food supply is significant to this study.

The objective of this study is first to elicit if consumers (both Muslims and non-Muslims) are WTP a premium for Halal produced chicken. In high-income countries where the majority of the household budget does not go to food purchases, the expectation is that Muslims would be willing to pay a premium. In low-income countries where consumers are typically trying to minimize cost this may not be the case. If it is found that non-Muslims are WTP a premium for Halal it may signal to meat processors that Halal can proxy for food safety or quality. Second, this study attempts to elicit if low-income consumers in Mozambique would be WTP a premium for a branded chicken product. As there is no Food and Drug Administration in Mozambique and very little food safety regulation, branding may again, be a proxy for food safety. Poultry is the fastest growing protein across Africa and processors must determine if it is worth investing in branding their product through marketing and slaughtering according to Halal rules. This study, while myopic to Northern Mozambique, provides a methodology which could be replicated across Africa to help answer these important questions regarding marketing on both brand and Halal production.

## **METHODOLOGY**

Over the course of two weeks in May of 2019, over 312 people in Nampula, Mozambique were surveyed on their buying preferences of whole frozen chickens. Questions were broken up 12 possible buying options and labeling combinations. For each response,

questions were randomized so respondents were shown 6 different questions containing buying options. Ideally, random sampling would have been used. However, due to time and logistical restraints, convenience sampling was the method used to recruit participants.

Information presented to survey participants included a control (with only a picture of a frozen chicken), if the chicken was slaughtered in a Halal manner and if the chicken was produced by New Horizons (NH). Thus, participants had two information sets broken up into 4 possible combinations for purchasing a frozen chicken (halal only, NH only, halal and NH and control). Three different pricing options were associated with each of the four possible purchasing options above. These prices were chosen by current price averages of processed chicken at the time of the study. Prices were measured in the metical, the currency of Mozambique. These prices were 165MZN, 195MZN, and 225MZN for a 2kg frozen chicken.

This method was used, as opposed to an orthogonal design, to eliminate dominant alternatives. These pretest prior values were chosen on the basis of the assumption that price should be negative and attributes positive, as was generally observed when testing the survey on students and colleagues. The final design used the coefficients of the pretest random parameters logit model (RPL) as the prior values in a new Bayesian design optimized on D-efficiency. All designs were created in Ngene version 1.1.2. Label attributes were balanced. However, the price attribute could not be balanced without requiring a much larger number of choice tasks per person or a larger sample size. The results, however, are robust to the elimination of the extra choice sets

Figure 1 illustrates 3 of the possible 12 choices a consumer was presented with. These choices were randomized such that each consumer was presented with a different choice set. Participants were shown three options at one time and asked to choose which one they preferred.

While the three buying options were randomized between the 12 total options, participants were always given a “no buy” option to opt out of choosing between the three options presented. Participants were shown a total of 6 choice sets (which included three buying options) before completion of the experiment.

The primary location for this study in Nampula was a local grocery store, ShopRite. ShopRite is Africa’s largest food retailer (Farfan, 2019), attracting a wide demographic of customers. While not ideal (as many Mozambicans do not have electricity, more over a freezer), ShopRite provided a central location where consumers were coming to purchase food. Alternative locations such as open-air markets were considered, but there are no labels or identity preservation associated with live poultry and as such frozen poultry with labeling and branding was chosen as the medium of study. The survey was offered in two languages: English and Portuguese. A translator was also utilized to administer the survey as some participants preferred to have the survey translated in the local tribal language Makua. Along with six choice-based questions (see Figure 1 below), two questions were asked to obtain the respondents demographic information: one regarding the respondents’ age, and one asking which religion the respondent identifies with (Christian, Muslim, or other). Before the respondent was shown the six choice-based questions, we provided them with a brief description of the impetus of the survey. The description reads “we are wanting to know which frozen chicken product you would buy if you could. We will show you options of chicken with New Horizons or Halal labels and will choose the option you would pay for.” The variables that were shown in the choice-based experiment were chosen based on current product availability in grocery stores like ShopRite. Frozen, processed chicken is most often sold as the whole bird, indicated by the image shown in the figure below. The New Horizons logo used in the survey was provided by a representative of

the company. The Halal logo shown below is the official Halal logo for Mozambique Muslim Commission.

Which of these do you prefer?



Which of these do you prefer?



*Figure 1 Example of Choice Based Experiment Options*

After the choice-based experiment was completed several questions were asked pertaining to buying habits of frozen poultry in Mozambique. The first question asked about which region each participant practiced, this was asked to obtain if the respondents' religion had an effect on their buying preferences, given that Muslims are only supposed to eat Halal meat. The next question asked whether the respondent typically buys live or processed chicken; it is common for Mozambicans to buy live chickens for the purpose of laying eggs and providing

meat. If the respondent typically buys live chicken over processed chicken, this could affect their WTP for frozen chicken. It was then asked if the respondent thinks that Halal meat is safer than non-Halal meat. This question was asked because it was originally hypothesized that Halal meat could be a proxy for food safety for people even if they do not practice Islam. Respondents were then asked if they thought that Halal meat was of better quality than non-Halal meat. It was also hypothesized that Halal branding could serve as a proxy for higher quality meat to some people, which is why this question was asked in addition to the previous question. The last question asked was whether or not the respondent worked for New Horizons. Since the company is a large and well-known employer throughout the Nampula area, it was possible that company employees were surveyed. This could have created bias in the respondent's answers to the choice-based questions.

A random parameters logit (RPL) model was estimated using simulated maximum-likelihood techniques, where an individual's utility for a given poultry alternative is a function of the alternative's attributes and their price levels. The alternative specific constant (ASC) in the model is the "no buy option". In this case, mean utility parameters and their standard deviations are estimated for Price, "New Horizons Brand", "Halal", the interaction between "Halal" and a respondent being Muslim, and "No Buy". The interaction between Muslim and Halal was warranted given the possible compounding effect of the two independent variables. Marginal WTP values were then computed by dividing each mean parameter by the negative of the Price coefficient.

## **RESULTS**

Of the 312 respondents in the study, 34 percent of respondents were between 25 and 34, 33 percent of the respondents were between 18 and 24 and 22 percent of respondents were

between 35 and 44 years old, and just 10 percent of respondents were ages 45 or older. This demographic information is reflective of the age structure in Mozambique. The current median age in Mozambique is just 17.6 years old, with a life expectancy of 62.13 years (Worldometer, 2021). Religious demographics indicated that 56 percent of respondents identified as Christian, 42 percent identified as Muslim, and the remaining 2 percent selected the “other” choice. Although 9.8% percent of respondents said they do work for Mozambique, their responses were eliminated in certain calculations to avoid bias.

		All respondents	Muslim Respondents	Christian and Other Respondents
Do you usually buy live or processed chicken?				
	Live	70.1%	77.0%	65.0%
	Processed	29.3%	21.6%	35.0%
	Prefer not to respond	0.6%	1.4%	0.0%
		All respondents	Muslim Respondents	Christian and Other Respondents
Do you think Halal meat is safer than non-Halal meat?				
	Yes	69.0%	91.9%	52.0%
	No	16.7%	4.1%	26.0%
	Prefer not to respond	14.4%	4.1%	22.0%
		All respondents	Muslim Respondents	Christian and Other Respondents
Do you think Halal meat is of better quality than non-Halal meat?				
	Yes	64.4%	85.1%	49.0%
	No	21.3%	8.1%	31.0%
	Prefer not to respond	14.4%	6.8%	20.0%
		All respondents	Muslim Respondents	Christian and Other Respondents
Do you work for New Horizons?				
	Yes	9.8%	6.8%	12.0%
	No	85.1%	90.5%	81.0%
	Prefer not to respond	5.2%	2.7%	7.0%

*Table 1 Results of Supplemental Questions.*

While 70 percent of the respondents in this study (Table 1) typically buy live chicken over processed, it is difficult to put branding on a live animal. Therefore, emphasis is placed on processed chicken in this study. The data shows that Muslim respondents hold Halal meat in regard than non-Muslim respondents in relation to safety and quality. Of all respondents, 69% thought that Halal meat is safer than non-Halal meat and 64% of all respondents thought that Halal meat is of better quality than non-Halal meat. When looking at the sub-sample by religion not surprisingly, a higher Muslim participants thought that Halal meat was of better quality

(85%) and was safer than non-Halal meat (92%). It should be noted that this experiment took place during the month of Ramadan which could have biased these responses.

Model results and marginal WTP values are reported on Table 2. Table 2 illustrates several important themes. First, the alternative-specific constant (ASC) for “No Buy” is negative which shows that people prefer to purchase poultry over opting out. This is not surprising as all participants were surveyed while making shopping decisions. Alternatively, this could indicate hypothetical bias as poultry is a luxury good in Mozambique which most Mozambicans would infrequently consume, specifically frozen poultry. Further, the participants were told at the beginning of the survey that this study was about poultry which could have biased their decision to choose an option which was not “no buy.” Regardless, our results indicate that the majority of participants interviewed would rather purchase a poultry alternative rather than not purchasing poultry in general.

Importantly the coefficient for Price is significant ( $P < 0.001$ ) and negative as theory predicts which would imply that consumers were acting rationally and the law of demand holds. While this result seems intuitive it is an important check to ensure that participants understood the survey, paid attention to the survey options and comprehended alternative choice sets throughout the survey.

#### Marginal WTP

##### Branding

Marginal WTPs indicate that people on average are willing to pay a premium of 40.51 MZN (0.55 USD) for New Horizons Brand poultry ( $P < 0.05$ ). This is 20.7% greater than the average price (195 MZN) of the 2kg frozen chicken in the survey. This finding is significant as it suggests that at least in the frozen poultry market in Nampula that branding has an effect on

WTP. While the drivers of this premium are outside the scope of this study some assumptions can be drawn. First, New Horizons is a large employer in the in the Nampula region which likely increases its name recognition. Second, New Horizons has billboards across Nampula advertising its products (something which is rare in Northern Mozambique) which also may familiarize participants with its product. Finally, participants only had one brand to choose from (there was no alternative branded poultry product) and as such they may have anchored toward that choice decision. While name recognition may have driven the WTP there is still the likely possibility of hypothetical bias where participants may be WTP a premium for New Horizons but not 20.7% if faced with an actual transaction. With all of that being said, this result is important because it suggests that even poor consumers who often times maximize caloric intake on a tight budget constraint put value into branding. Further research is warranted to determine what drives this premium but alternative options could be issues such as perceived food safety, valuing local food production (many frozen chickens are imported from South Africa) and quality.

## Halal

Table 1 illustrates that the mean WTP premium for Halal is not significantly different from zero ( $P > 0.10$ ) indicating that on average participants were not WTP a premium for a Halal produced chicken from a non-Halal produced chicken. These results are not too surprising given the large percentage of non-Muslim (58%) participants in the study. However, when looking at the interaction between Muslim and Halal (a subsample of only those who identified as being Muslim) we see a positive and significant ( $P < 0.10$ ) coefficient on the marginal WTP. This result indicates that Muslim participants in the study were WTP 37.10 MZN more for poultry produced in a Halal manner over a non-Halal manner. This would represent a 19% premium for Halal poultry. Like with the branding coefficient some caution needs to be used when interpreting this.



There is likely more hypothetical bias in this estimate given its association with “appropriate” religious behavior. Second, this survey was conducted during Ramadan which likely influenced decision making even more for Muslim participants. The question about religion was asked after the choice set questions to mitigate this bias but none-the-less there is likely hypothetical bias.

These results would suggest two things. First, non-Muslims derive no utility from Halal produced poultry in our study. One of the main hypotheses of this paper was to estimate if non-Muslims would be WTP for Halal as it could signal higher quality or safer type of food, this does not appear to be the case. Based the responses on Table 1, non-Muslims do associate Halal poultry to be safer (69%) and of better quality (64%) they were not found to be WTP a premium for these attributes. Second, religious norms seem to hold even in the face of poverty. It would appear that even in the poorest regions of one of the poorest countries of the world Muslim consumers are WTP a premium to uphold their religious beliefs. These results are important as a large portion of Northern and coastal Mozambique is Muslim and poultry production and consumption is growing nationwide. These results should not be used for exploitation (deriving the max WTP) but rather to show demand for a product.

**Table 2. Random Parameter Logit Model and Respective Marginal WTP Results.**

<b>Parameter</b>	<b>RPL</b>	<b>Marginal WTP</b>
New Horizons Brand	0.506*** (0.109)	40.51** (13.4)
St. dev. (SD)	0.759*** (0.166)	60.74** (20.1)
Halal	-0.061 (0.143)	-4.86 (11.3)
SD	0.867*** (0.142)	69.37*** (19.3)
Halal x Muslim	0.464** (0.216)	37.10* (19.2)
SD	0.055 (0.540)	4.40 (43.3)
ASC (No Buy)	-9.930*** (1.748)	-794.94*** (163)
SD	4.328*** (0.965)	346.45*** (95.5)
Price	-0.012*** (0.003)	-
SD	0.030*** (0.005)	-
Log L	-731.6	-
N	1008	1008

\* Significant at the level  $p < .1$

\*\* Significant at the level  $p < .05$

\*\*\* Significant at the level  $p < .001$

## CONCLUSION

Our results from the small sample in our study indicate that even in low-income countries like Mozambique consumers are WTP a premium for branding. Specifically, Muslim consumers are WTP a premium for Halal produced meat with branding. These data align with the original assumption, but this conclusion alludes to many things.

In communities like Nampula, this branding could be a proxy for food safety concerns. Table 1 shows 69 percent of respondents in the Nampula market area said that they do think Halal meat is safer than non-Halal meat. Companies could use Halal branding as a signal of safety and quality among meat products and could reach a market much larger than just Muslim consumers.

This conclusion also proposes an ethical dilemma: whether companies should capitalize on the religious choices of consumers. Assuming Muslim consumers are going to buy Halal meat regardless, knowing how much they are willing to pay for Halal meat puts the pricing power in the producer's hands. Capitalizing on such a personal part of a person's life is an intricate and delicate topic that could be studied further. However, as previously mentioned, these results should not be used for exploitation but rather to show demand for a product.

These results are important as in many low-income countries commodities (such as live/processed chickens) have no branding associated with them. This should signal to meat producers to market appropriately in order to increase market share (via Halal labeling) and overall sales without the exploitation (increasing prices) of consumers. Knowing the willingness to pay of such products could serve as a starting point for companies, given the willingness to

pay is the highest amount consumers would pay for a product in a hypothetical setting. It is safe to assume that the actual price a consumer would pay is lower. The willingness to pay for New Horizons branded poultry varies significantly throughout the data, showing an inconsistency in loyalty to the company but still confirming that brand loyalty is an important concept, and it should be furthered studied in developing countries. Similar studies could be conducted to study the significant role that local businesses may play in developing food systems. This kind of data could provide producers with insight on how to approach marketing efforts in countries like Mozambique.

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