



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

# Consumers' preferences for animal-source foods and retail outlets: The case of Tanzania

Derek Baker\*

University of New England, Armidale, New South Wales, Australia. E-mail: derek.baker@une.edu.au

Nadhem Mtimet

International Livestock Research Institute, ILRI, Nairobi, Kenya. E-mail: n.mtimet@cgiar.org

Ugo Pica-Ciamarra

Food and Agriculture Organization of the United Nations, FAO, Rome, Italy. E-mail: ugo.picaciamarra@fao.org

Longin Nsiima

Ministry of Livestock and Fisheries Development, Dar es Salaam, Tanzania. E-mail: nsiaalalongin@gmail.com

\*Corresponding author

## Abstract

*Growth in population and income, as well as urbanisation, are contributing to the growing consumption of high-value foods in developing countries. However, public and private investments targeting high-value agricultural markets are constrained by limited information on the quality dimensions of the market, the nature of traditional retail formats, and consumer segmentation. This paper presents a simple and appropriate methodology to provide such information, and applies it in Tanzania to animal-sourced foods. It features a rapid survey, which is then aligned with nationally representative survey data. The results show that Tanzanian consumers demand, and are anticipated to continue demanding, relatively good-quality animal products but in rather low-valued product forms. Consumer segments are differentiated by level of wealth and by choice of retail format and retail product form, rather than by quality per se.*

**Key words:** retail development; animal-source foods; consumers' preferences; developing countries; Tanzania

## 1. Introduction

Growth in demand for high-value foods in developing countries has largely been attributed to a combination of population and income growth, and urbanisation (Delgado *et al.* 1999; Caballero & Popkin 2002). Animal-sourced foods (meat, milk and eggs) have been identified as products for which growth in demand is projected to be particularly rapid (Kearney 2010; FAO 2011). A notable, yet often overlooked, feature of developing country-aggregate food-demand projections is the contribution of future population growth, which easily dominates income and other factors affecting *per capita* consumption, particularly in Africa (Pica-Ciamarra & Otte 2011).

The advance of modern food and grocery retailing and associated developments in the value chain in developing countries have been described widely (Goldman, 1981; Reardon *et al.* 2004; Mergenthaler *et al.* 2009). Past studies of constraints to supermarket penetration in developing countries have emphasised commercial concerns such as supply chain development (Reardon & Timmer 2012), product category diffusion (Goldman *et al.* 2002), and social and ethnic effects manifest as inertia (Amine & Lazzaoui 2011). Today, a variety of retail outlet formats and channels exist in most

developing countries, and their paths of development and co-existence have been the subject of recent research (Reardon & Minten 2011; Gomez & Ricketts 2013). Despite substantial gains made by supermarkets, “traditional” markets still dominate retail markets for meat, dairy and certain other fresh and high-value products in many developing countries (Tschirley *et al.* 2009; Gorton *et al.* 2011). Hammond *et al.* (2007) conclude that the four billion people living on less than \$10 a day represent a food market of about US\$ 2.9 trillion per year. This market exists primarily in developing countries and is largely served by food retail formats that are traditional and informal in nature (FAO 2007; Mtimet *et al.* 2013; Grace *et al.* 2015).

Opportunities for livestock producers and stakeholders that serve this growing demand thus have been identified as a source of potential economic growth that would favour the poor (Upton 2004; Pica-Ciamarra *et al.* 2014a). However, past research has focused largely on the quantity dimension of the market, while the investment necessary to mobilise business opportunities – including public policies – should also utilise information of volumes, quality, food safety attributes and consumers’ preferred retail outlets. The needs of investors in segmenting and serving developing country retail markets, for example, have been detailed in just a few studies (e.g. Prasad & Ankiseti 2011), as has information flow in alignment with actors within the chain (Kapur 2008; Bamiro & Shittu 2009; Chung *et al.* 2011; Reardon & Timmer 2012).

This article proposes a method for the identification and measurement of quality variables that are appropriate for developing country settings, for relevant and rapid processing of the data, and for the generation of results suitable for food value chain participants. This method is applied to the case of Tanzania, where food retailing uses a variety of channels but is dominated by traditional markets. The article advocates and demonstrates the generation of simple yet specialised datasets and simple analyses that can inform investment and other commercial decisions. It also acknowledges and encourages the use of existing sources of data, particularly those that are publicly and freely available. As examples, current and projected volumes of animal products consumed are offered by the OECD-FAO Agricultural Outlook (OECD and FAO 2013), and Living Standards Measurement Surveys relate household consumption to income and demographic data (Pica-Ciamara *et al.* 2014b). The method adapts rapid consumer survey approaches in order to identify relevant quality and safety attributes, consumer segments, retail product forms, and retail outlets. The results are then triangulated with aggregate nationally representative survey data to motivate conclusions from nationally representative analysis.

Section 2 of this paper summarises the market for livestock products in Tanzania, specifically the current and projected quantities of livestock products consumed. Section 3 describes the consumer survey design, and section 4 is a summary of the results. Section 5 analyses nationally representative, publicly available datasets on the consumption of animal-source foods by category of consumer, and relates this analysis to this study’s more specialised consumer survey data. This complementary treatment of data sources enables greater inference from the survey data. Section 6 lists and discusses conclusions.

## **2. Tanzania’s market for foods of animal origin**

Tanzania’s 2012 population of some 48 million grew by 3% per year from 2006 to 2012. Although a low-income country, Tanzania has recently displayed rapid economic growth: an average of 7% per year from 2002 to 2012, which means a per capita growth of 3.9%. A growing demand for animal-sourced foods is therefore widely expected (FAO 2011; World Bank 2014). Projections by the FAO’s Global Perspectives Studies Unit feature consumption increases for beef, mutton and goat meat, pork, poultry and milk to increase by 87%, 71%, 88%, 148% and 108% respectively from the mid-2000s to 2030 (Table 1).

**Table 1: Current and projected Tanzanian consumption of selected animal-source foods**

Livestock product	Total consumption (000, tonnes)		Per capita consumption (kg or litre)	
	2005/2007	2030	2005/2007	2030
Beef	262.5	490.7	6.5	6.5
Sheep and goat	40.9	70.0	1.0	0.9
Pork	13.5	25.4	0.3	0.3
Poultry	51.8	128.3	1.3	1.7
Milk	944.2	1 962.9	23.5	26.0

Source: Courtesy of the FAO Global Perspectives Studies Unit

The average income of a Tanzanian household, according to the National Panel Survey 2012/2013 (National Bureau of Statistics 2014), is about USD 1 250 per year, or USD 250 per person per year. This figure is lower for the approximately 65% of households that live in rural areas (USD 875/year), and higher for urban households (USD 2 081/year). At this level of income, the consumption of livestock products is limited. Indeed, in the National Panel Survey the large majority of households reported not regularly consuming livestock products. Table 2 presents nationally representative statistics on the percentage of households that responded yes to the question, “Within the past 7 days, did the members of this household eat/drink any livestock product within the household?”

**Table 2: Proportion of households consuming animal source foods in the past seven days**

Livestock product	All	Urban	Rural
Beef	35.3 %	56.5 %	25.6 %
Goat meat	11.2 %	5.4 %	13.8 %
Pork	4.1 %	3.5 %	4.3 %
Chicken	15.2 %	16.9 %	14.5 %
Milk	25.5 %	27.2 %	24.8 %

Source: Elaborated from National Bureau of Statistics (2014)

The low levels of consumption and income also suggest that, on average, consumer preferences are for relatively cheap livestock products and that, with the possible exception of Dar es Salaam, it will take quite some time for a supermarket revolution to become fully established in Tanzania. At present there is no information available on Tanzanian consumers’ preferred product quality and retail form, nor on preferred retail outlets. The generation of this information is the focus of this article. In particular, our study targeted beef, poultry and milk, as these products are the most consumed animal foods, exhibit the highest volumes of current and projected production, and at the same time display among the highest expected growth in demand.

### 3. A survey that targets quality and consumer segments

#### 3.1 Micro-level variables of interest

The first analytical task was the identification and measurement of the quality dimensions of the market in order to complement the available volume-oriented data for beef, chicken and milk presented in Table 1 above. The forms taken by products in the market, their quality (including safety) attributes, the retail outlets selling them, and consumers’ preferences for them were all assessed in a form disaggregated by a consumer typology. Interviews with expert informants were used to characterise observation points (retail outlets) and product forms for each of beef, chicken, eggs, mutton and goat meat, pork and fluid milk. Six retail outlet types were identified, namely: (1) specialist butcheries; (2) roadside outlets; (3) open air “wet” markets; (4) small shops; (5) supermarkets; and (6) specialist milk kiosks.

Five main retail forms for each livestock product were selected by the expert informants. Food quality and safety attributes were drawn primarily from work by Jabbar *et al.* (2010), supported by the available literature (Grunert 2005; Mergenthaler *et al.* 2009; Cicia & Colantuoni 2010), and

confirmed in discussion with the expert informants. A vital empirical consideration was that selected quality attributes be visible to the enumerator, as this enables direct assessment without reference to the opinions of survey respondents. The quality attributes varied by commodity group (details available from the authors), e.g. for beef: (1) freshness, which is correlated with meat colour and hence observed in that context; (2) visible fat cover; (3) intramuscular fat (“marbling”); (4) premises’ cleanliness and freedom from flies; and (5) packaging.

Income level, and more particularly the empirical capacity to differentiate between income levels, required the use of a proxy measure that involved a non-invasive question free of respondent bias. From a narrow range of possibilities, ownership of means of transport was selected. This not only reflects wealth but also contributes directly to purchasing behaviour by influencing the distance consumers can travel. This measure can be contentious (Morris *et al.* 2000; Lindelow 2006), as the absence of a means of transport can mean, for example, that a poor consumer purchases products that are more expensive than those purchased by wealthier ones due to being forced to shop locally (Ballantine *et al.* 2008; Hatch *et al.* 2011). Nevertheless, this variable was chosen because it supports the objective of the study, namely to develop and test a low-cost, easily replicable methodology,<sup>1</sup> it supports identical information that is collected in nationally representative surveys, thus enhancing the method’s consistency with other data sources, and it is easily described and understood by all parties to a survey question.

### 3.2 Data recording

Following training, the enumerators’ actions extended to questioning consumers and directly observing product forms and qualities, as described above. This took place in retail outlets as identified in a stratified random sampling by rural/urban location, and by retail format.

The quality variable was recorded as a simple (unweighted) sum of zero-one values assigned to the identified quality attributes (Table 3). The resulting scores are on an interval of 0 to 5. This has the advantages of simplicity, and of eliminating consumer or retailer assessment. The unweighted sum may well under- or overestimate the significance of some aspects of quality, but was maintained throughout because expert informants (see below) were unable to agree on appropriate weights.

**Table 3: Quality scale for livestock products**

Number of attributes recorded	Quality score
0 - 1	Low
2	Lower-medium
3	Medium
4	Upper-medium
5	Good

A questionnaire was administered to consumers observed buying a given livestock product. The sampling design enabled observations of the quality of the product, of a given retail form, at a given retail outlet. A question was posed (on means of transport owned) and used to establish three levels of income classification: the worse off (58 respondents; 40% of sample size) did not own any means of transport; the middle class (47 respondents; 33%) owned a motorcycle; and the better off (39 respondents; 27%) who owned a car. Consumers were posed questions about why they purchased from a particular outlet, about trends in their consumption of the nominated retail products, and their willingness to spend more on specified livestock products. Crucially, the consumer interview was implemented in around five minutes in each case.

<sup>1</sup> In longer interviews, where elements of validation are possible, an asset index (e.g. Montgomery *et al.* 2000; Brandolini *et al.* 2010) offers an alternative approach.

## 4. Implementation and results in Tanzania

### 4.1 Sample details

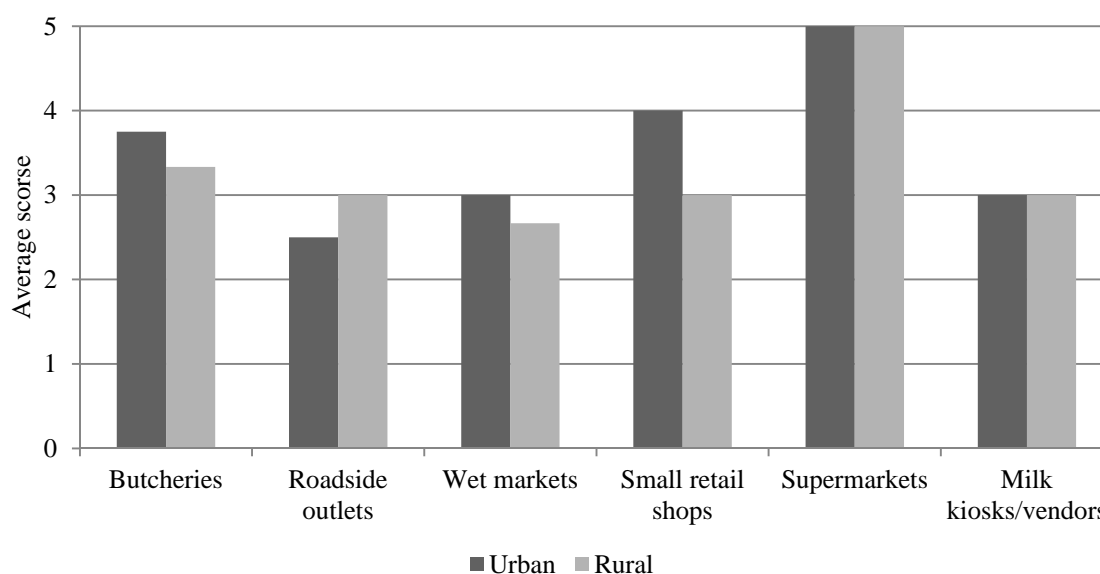
A stratified random sampling method was used to select urban and rural locations and the indicative types of retail outlet in those locations, including butcheries, roadside outlets, wet markets, small retail shops, supermarkets and milk kiosks/vendors. For each of the six types of retail outlet, three establishments in urban areas and three in rural areas were randomly selected, i.e. a total of 36 outlets. In each retail outlet, four consumers were selected randomly – *viz.* the first four that purchased livestock products during the enumerator’s presence in the shop – for a total of 144 consumers. Enumerators spent a maximum of one hour in each outlet, as market days or mornings/evenings were selected as days for the survey. Data collection took place in October 2011 in two urban, and one rural, district near to Dar es Salaam.

**Table 4: Details of sample: by retail outlet type**

Retail outlet type	No. of retail outlets visited	No. of consumers interviewed
Butcheries	6	24
Roadside outlets	6	24
Wet markets	6	24
Small retail shops	6	24
Supermarkets	6	24
Milk kiosks/vendors	6	24
Total	36	144

### 4.2 Observed quality scores

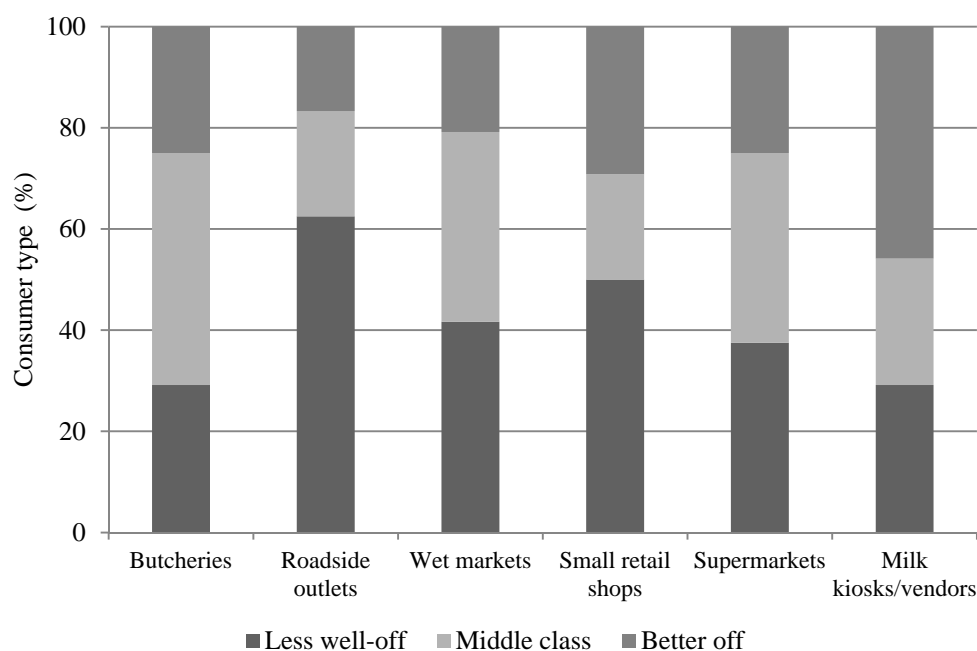
The quality and safety scores indicated that products sold by urban retailers exhibited quality that was equal or superior to that sold in rural outlets, with the exception of roadside outlets (Figure 1). When quality scores were evaluated by retail outlet, supermarkets achieved the highest quality score in both urban and rural areas, although the small supermarkets found in small rural towns were significantly different from urban supermarkets. Butcheries ranked second for quality. With the exception of supermarkets there was little variation across rural retailers in terms of quality scores: all exhibited “medium” ratings. The variation was more pronounced among urban retailers, where supermarkets scored 5 (good quality) and roadside outlets scored 2.5 on average (lower medium quality).



**Figure 1: Average quality and safety scores in retail outlets: urban and rural areas**

### 4.3 Preferred retail outlets

Across all wealth categories, consumers were found to purchase animal-source foods in all retail outlets. Less well-off consumers, however, were more likely to purchase livestock products at roadside outlets and in small retail shops than were middle-class and better-off consumers. These latter two (wealthier) groups prefer supermarkets, butcheries and milk kiosks. A surprising result is that open-air markets were a preferred retail outlet for all consumers, regardless of wealth category. A possible explanation centres on price, which was found to be significantly lower in roadside outlets and small retail shops (the median price across all products recorded was TSh<sup>2</sup> 2 250 and 2 400 per purchase lot respectively) than in butcheries and supermarkets (TSh 5 000 and 4 000 per purchase lot respectively). Another motivation centres on convenience and familiarity with the vendor.

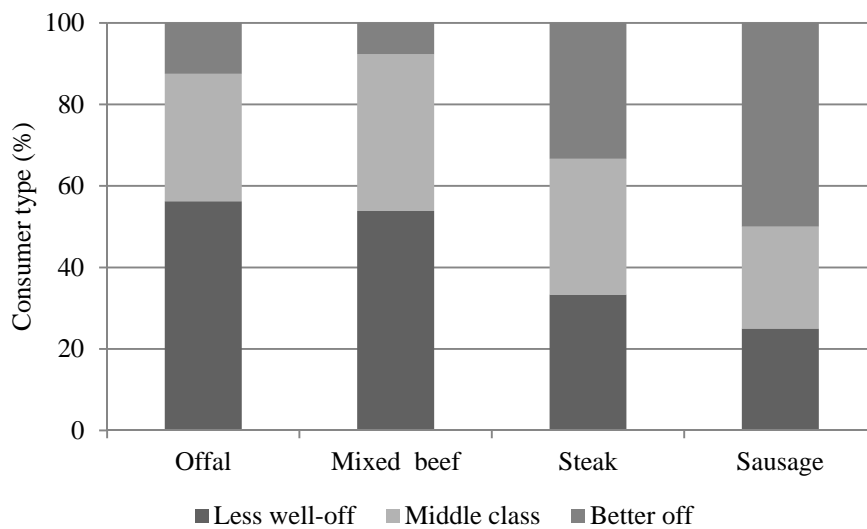


**Figure 2: Proportions of consumers purchasing in retail outlet formats, by income category**

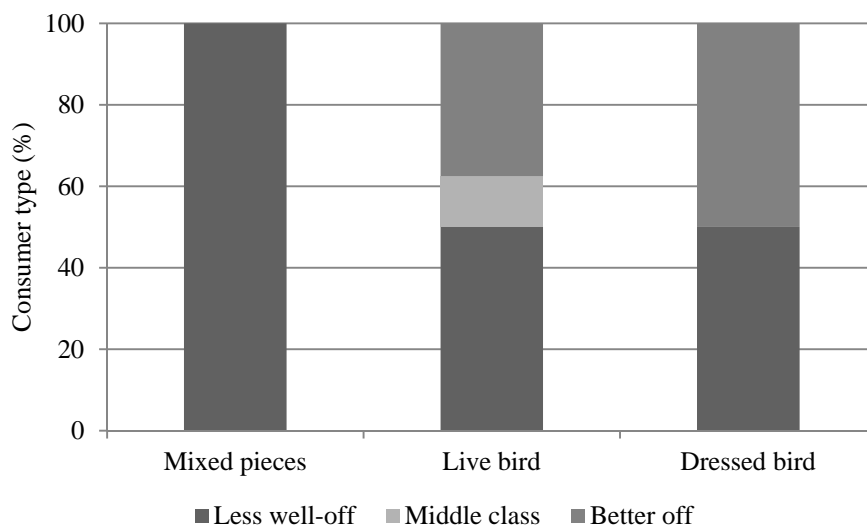
### 4.4 Preferred retail forms

Preferences for retail product form, disaggregated by income tercile, are presented for beef, poultry and milk in Figures 3 to 5 respectively. The results for pork and goat meat (not reported here due to space considerations) provided no statistically significant differences across income terciles.

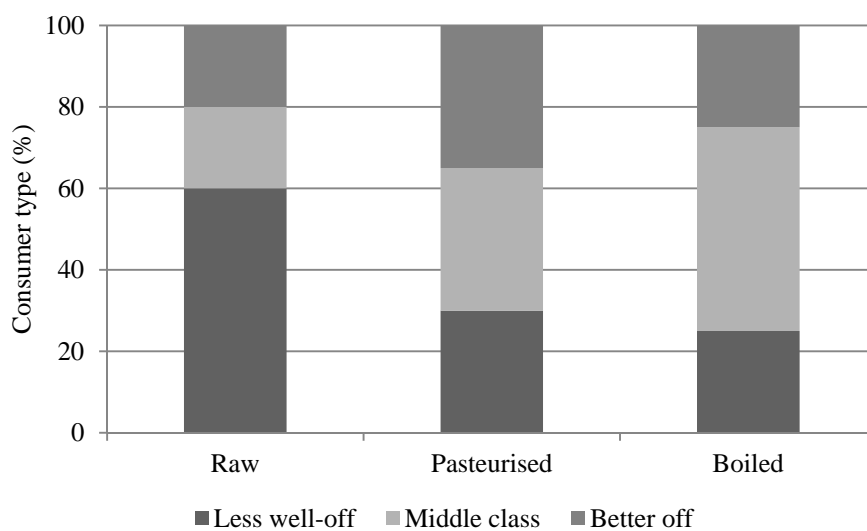
<sup>2</sup> In October 2011, the US\$-TZSH exchange rate was 1 600.



**Figure 3: Proportions of consumers purchasing beef retail product forms, by income category**



**Figure 4: Proportions of consumers purchasing poultry retail product forms, by income category**



**Figure 5: Proportions of consumers purchasing milk retail product forms, by income category**



A relationship was apparent between income level and preferred product form for the three commodities presented, but this should be tempered with an understanding of retail practices in developing countries. In particular, the small quantities purchased mean that, even at a high price, these represent small expenditures that may not fully reflect income-related effects. Moreover, small samples also encourage some caution in our inference.

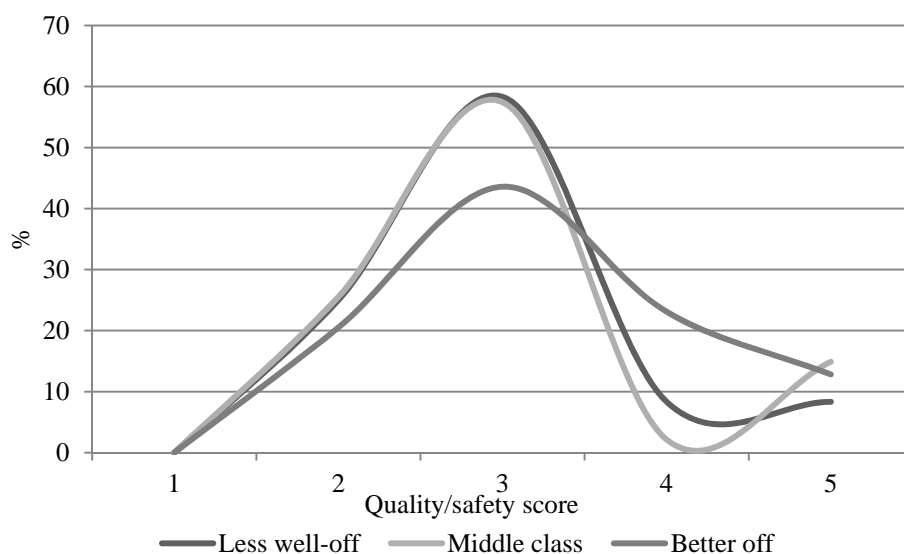
For beef, the consumers in the poorest tercile purchased either offal or mixed pieces (the lowest priced beef products), which are reported not to be consumed in large quantities by better-off consumers (Figure 3). Conversely, steak and sausages are apparently consumed by all types of consumers, but the sample numbers are small for these product forms.

The less well-off are the only ones who reported purchasing the (low-priced) mixed pieces of chicken. Live birds are reported to be purchased by all consumers. The considerable variation in reported prices for live birds should be noted here, particularly as the data do not differentiate between local and imported breeds, for which demand conditions may be quite different.

In the case of milk, raw fresh milk was purchased mainly by the poorest consumers. As in the above cases, prices may not be the primary influence on income-related milk product purchase choices: the price per litre of raw fresh milk was found to differ little from that of pasteurised milk (both around TSh 1 000 per litre). Poor consumers may be compelled to purchase the products available from retail establishments to which their means of transport enable access. There may also be an abiding consumer preference for raw fresh milk, which outweighs safety-related concerns. The results also show that boiled milk is purchased primarily by middle-class and better-off consumers.

#### 4.5 Consumers' preferred quality

Consumers' frequency of quality scores of food items, as an aggregate result across all products purchased, is presented in Figure 6. It should be noted that these results report behaviour as observed and recorded by enumerators – they are not “reported behaviour”. Consistent with the observed quality/safety levels, which we found to be relatively high across all products and retail outlets, the most frequently occurring quality score was high for consumers at all levels of wealth. The similarity of the curves is reinforced by the statistical results, which reveal no significant differences between income categories for qualities purchased.



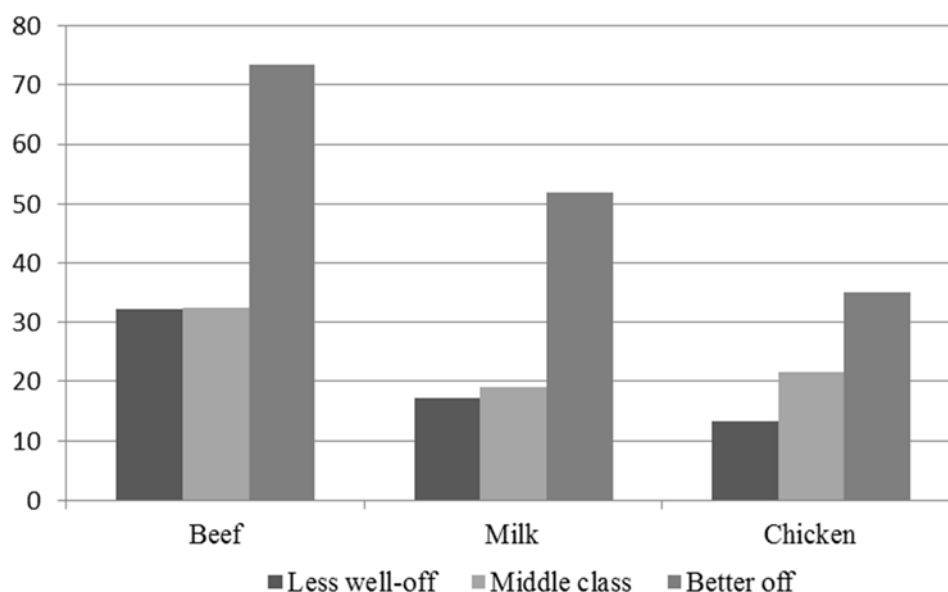
**Figure 6: Frequency distribution of quality/safety scores by income category**

A plausible explanation for this result is that the poorest consumers purchase livestock products less frequently than do others, and so any purchase of such a food item is contemplated with caution, with due consideration of alternatives. In support of this explanation, the great majority of consumers reported perceived quality and safety as being the most important determinant of choice of retail outlet, with the related “known, trustworthy premises” also prominent in the analysis. Quality choice results for individual commodities or product forms are not presented here, but these were largely similar to the aggregate results shown.

## 5. Combination of results with aggregate data available in Tanzania

This article’s rapid appraisals of consumer preferences for retail outlets and product forms are consistent with the prevailing wisdom, and aspects of patterns of demand seen in publicly available aggregate data. Further alignment with data drawn from Tanzania’s 2008/09 National Panel Survey (National Bureau of Statistics 2010) allows us to arrive at a national-level estimate of the demand for major livestock products by preferred retail forms and retail outlets.

The nationally representative National Panel Survey (NPS) statistics on commodity-level household purchases and consumption of livestock products also feature ownership of means of transport. Figure 7 presents the proportion of households reporting the purchase of beef, chicken and milk, again by wealth category – defined by the means of transport owned – using the same categories as used above. Over 70%, 50% and 30% of the better-off consumers reported regularly (at least once per week) purchasing beef, milk and chicken respectively, while middle-class and less well-off households reported purchasing animal-source foods less frequently.<sup>3</sup>



**Figure 7: Proportions of households purchasing beef, poultry meat and milk by income category**

Source: National Bureau of Statistics (2010)

For beef, milk and chicken, better-off households purchased animal-source foods more frequently than those from other income classes, but also consumed these products in larger volumes. As an example, the 2008/09 NPS data (National Bureau of Statistics 2010) indicate that each member of a

<sup>3</sup> The proportion of households reporting the consumption of animal-source foods was higher than those reporting the purchase of the same products because of households’ consumption of products produced at home. This is most apparent for milk and eggs, and to some extent for poultry meat, but is insignificant for livestock products derived from the slaughter of larger animals (beef or goat meat).

better-off household consumed about 400 grams of beef per week, compared with 300 grams for middle-class and less well-off consumers. Corresponding measures for milk are about 1 litre per week versus 0.75 litre.

For aggregate consumption of animal-source foods in Tanzania, the better-off consumers account for fewer than 5% of all consumers, while the middle-class and less well-off consumers represent some 39% and 56% respectively (National Bureau of Statistics 2010). Hence the “market” – as understood by investors and other commercial interests – is comprised largely of purchases by the less well-off (see Table 5), who represent 52.7% of the market for beef, 53.7% of the market for chicken, and 50.1% of the market for milk by both volume and value. Progressively smaller proportions appear for the middle-class and better-off consumers.

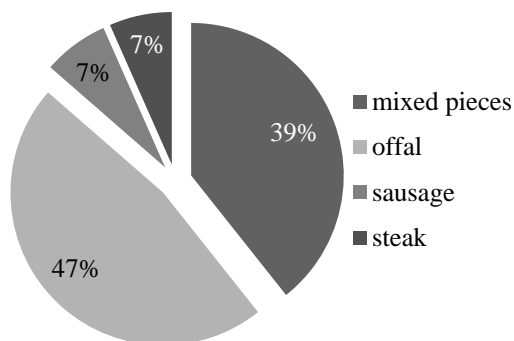
**Table 5: Market share by consumer income category**

Livestock product	Share (%) of market in quantity			Share (%) of market in value		
	Better off	Middle class	Less well-off	Better off	Middle class	Less well-off
Beef	12.1	35.3	52.7	14.1	32.7	53.2
Chicken	18.5	27.8	53.7	21.9	21.8	56.4
Milk	11.3	38.7	50.1	14.0	34.2	51.9

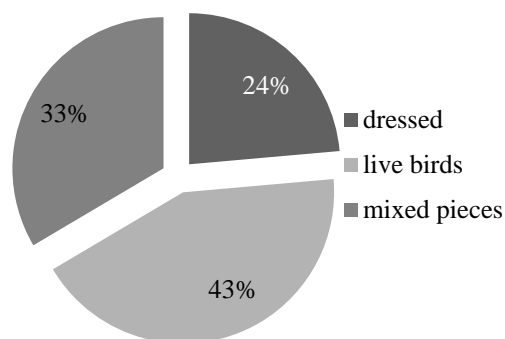
Source: National Bureau of Statistics (2010)

An extension of these results onward to a nationally indicative, quality-oriented projection of Tanzania’s market for animal-source food was constructed by combining elements of both the NPS data and the rapid consumer survey. Figure 8 represents the beef, chicken and milk markets disaggregated by preferred retail form, while each retail outlet’s market share is projected in Figure 9.

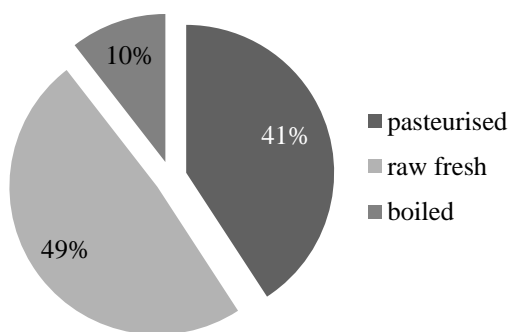
Beef market by consumers’ preferred retail form



Poultry market by consumers’ preferred retail form

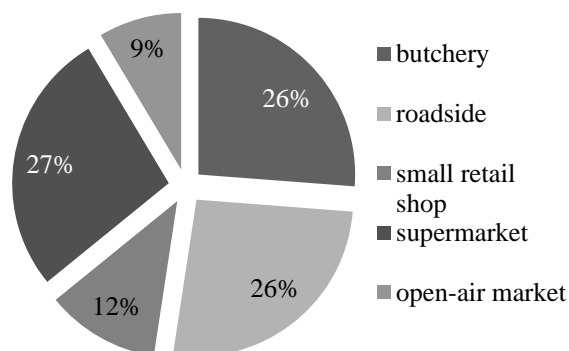


Milk market by consumers’ preferred retail form

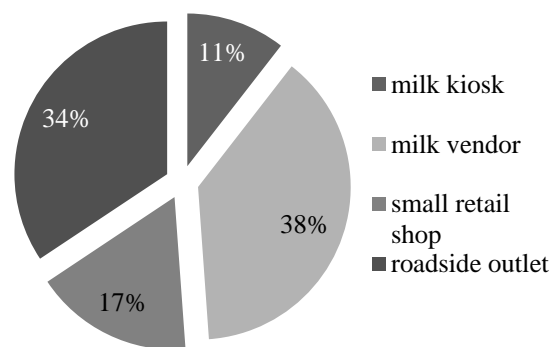


**Figure 8: Preferred retail product forms for beef, poultry and milk in Tanzania (by volume)**

Meat market by consumers' preferred retail outlet



Milk market by consumers' preferred retail outlet



**Figure 9: Preferred retail outlet for meat and milk in Tanzania (by volume)**

Projections for beef show that mixed pieces and offal represent almost 90% of the market. For poultry, the result is somewhat less pronounced, but live birds and mixed pieces dominate consumers' preferred product form, at 43% and 33% of the market respectively. For milk, the raw fresh product occupies some half of the market, with a surprisingly large amount of pasteurised milk and rather little (10%) boiled milk. Projections of the preferred meat retail outlets feature butcheries, roadside outlets and supermarkets, each accounting for 26% to 27% of the market in volume terms. Milk vendors and small retail shops dominate the milk market.

## 6. Conclusions

Investment and commercial action by food value chain actors in developing countries has been little studied beyond the context of supermarkets. In particular, traditional markets and co-existing retail formats are present in most African countries, and these serve the great majority of the population. In this article, a methodology was developed and tested to mobilise decision makers at the retail level and elsewhere regarding practical marketing steps, such as consumer segmentation and the delivery of desired qualities. The method is centred on a rapid survey procedure, from which results were then mapped onto nationally representative datasets to establish projections for the national market. The application of the method in Tanzania is reported.

Tanzanian consumers in identifiable, discreet wealth segments are found to purchase animal-source foods in different markets, and to prefer different retail products. On average, and using the simple quality measurement system developed, the quality of the livestock products sold and purchased is found to be good in both urban and rural areas. Moreover, the quality purchased by consumers in all wealth categories was found to be good. Unsurprisingly, given that the majority of consumers purchasing animal-source foods are less well-off, retail product forms preferred by these consumers were found to dominate the market. This means that offal and mixed pieces for beef, live birds and mixed pieces for chicken and raw milk for dairy are identified as the preferred product forms.

Three important conclusions emerge. The first is that cheap and timely procedures can be employed to generate substantial and relevant information about food value chain participants. The second is that, across consumers of all income levels, there is sufficient market in Tanzania for product quality and safety to enable market-led interventions such as product differentiation. The conditions supporting this development are a subject for future research, particularly in the realm of traditional markets. The third is that, despite Tanzania's relatively poor consumer profile and dominance of traditional markets, there are commercial opportunities for smallholder livestock producers.

The focus of this study was on demonstrating a method, and resource constraints necessitated a sample that was small and geographically limited. This resulted in limited inference on several items of undoubted interest to commercial parties, such as differentiation of rural and urban areas, and the robust estimation of preferred quality attributes for consumers in the different wealth categories. Several potential improvements in the method have been identified, such as more discriminating treatment of poultry breeds, a more sophisticated measure of income, and larger samples. Further work is called for to identify and overcome barriers to smallholder livestock holders' and agribusinesses' access to opportunities across co-existing retail formats in developing countries, and improved generation and communication of commercially relevant information.

### Acknowledgements

This research was funded by the Policy, Institutions and Markets Research Programme of the Consultative Group for International Agricultural Research. The work was conducted in association with the Livestock Data Innovation Project of the Bill and Melinda Gates Foundation, a joint project of the World Bank, the International Livestock Research Institute, the Food and Agriculture Organization of the United Nations, the African Union Inter-African Bureau for Animal Resources, and Tanzania's Ministry of Livestock and Fisheries Development.

### References

- Amine A & Lazaaroui N, 2011. Shoppers' reactions to modern food retailing systems in an emerging country: The case of Morocco. *International Journal of Retail & Distribution Management* 39(8): 562–81.
- Ballantine N, Rousseau GG & Venter DJL, 2008. Purchasing behaviour as a determinant of food insecurity in Klipplaat. *Journal of Family Ecology and Consumer Sciences* 36: 1–8.
- Bamiro OM & Shittu AM, 2009. Vertical integration and cost behaviour in poultry industry in Ogun and Oyo states of Nigeria. *Agribusiness* 25(1): 1–15.
- Brandolini A, Magri S & Smeeding TM, 2010. Asset-based measurement of poverty. Working Paper 755, Bank of Italy, Rome.
- Caballero B & Popkin BM, 2002. *The nutrition transition: Diet and disease in the developing world*. London, Academic Press.
- Chung J, Huang Y, Jin B & Sternquist B, 2011. The impact of market orientation on Chinese retailers' channel relationships. *Journal of Business & Industrial Marketing* 26(1): 14–25.
- Cicia G & Colantuoni A, 2010. Willingness to pay for traceable meat attributes. *International Journal of Food System Dynamics* 1(3): 252–63.
- Delgado C, Rosegrant M, Steinfeld H, Ehui S & Courbois C, 1999. *Livestock to 2020 – The next food revolution*. Food, agriculture and the environment. Discussion Paper 28, IFPRI, Washington DC.
- FAO, 2007. *Promises and challenges of the informal food sector in developing countries*. FAO, Rome.
- FAO, 2011. *Mapping supply and demand for animal source foods to 2030*. FAO Animal Production and Health Division Working Paper No. 2, FAO, Rome.
- Goldman A, 1981. Transfer of a retailing technology into the less developed countries: The supermarket case. *Journal of Retailing* 57(2): 5–29.
- Goldman A, Ramaswami S & Krider RE, 2002. Barriers to the advancement of modern food retail formats: Theory and measurement. *Journal of Retailing* 78: 281–95.
- Gomez M & Ricketts KD, 2013. Food value chain transformations in developing countries: Selected hypotheses on nutritional implications. *Food Policy* 42: 139–50.
- Gorton M, Sauer MJ & Supatpongkul P, 2011. Wet markets, supermarkets and the “Big Middle” for food retailing in developing countries: Evidence from Thailand. *World Development* 39(9): 1624–37.

- Grace D, Makita K, Kang'ethe E, Bonfoh B & Roesel K, 2015. Taking food safety into informal markets. In Roesel K & Grace D (eds.), *Food safety and informal markets: Animal products in sub-Saharan Africa*. Oxon: Routledge.
- Grunert KG, 2005. Food quality and safety: Consumer perception and demand. *European Review of Agricultural Economics* 32(3): 369–91.
- Hammond A, Kramer WJ, Katz RS, Tran JT & Walker C, 2007. *The next 4 billion: Market size and business strategy at the base of the pyramid*. World Resources Institute, Washington DC.
- Hatch G, Becker P & Van Zyl M, 2011. *The dynamic African consumer market: Exploring growth opportunities in Sub-Saharan Africa*. Cape Town: Accenture.
- Jabbar MA, Baker D & Fadiga M (eds.), 2010. *Demand for livestock products in developing countries with a focus on quality and safety attributes: Evidence from Asia and Africa*. ILRI Research Report No. 24, ILRI (International Livestock Research Institute), Nairobi, Kenya.
- Kapur V. 2008. Pioneering micro-entrepreneurship through poultry breeding and distribution in rural India. *Innovations – Technology, Governance, Globalization* 3(1): 37–51.
- Kearney J, 2010. Food consumption trends and drivers. *Philosophical Transactions of the Royal Society B* 365(1554): 2793–807.
- Lindelov M, 2006. Sometimes more equal than others: How health inequalities depend on the choice of welfare indicators. *Health Economics* 15(3): 263–79.
- Mergenthaler M, Weinberger K & Qaim M, 2009. Consumer valuation of food quality and food safety attributes in Vietnam. *Review of Agricultural Economics* 31(2): 266–83.
- Montgomery MR, Gragnoloti M, Burke K & Paredes E, 2000. Measuring living standards with proxy variables. *Demography* 37(2):155–74.
- Morris SS, Carletto G, Hoddinott J & Christiaensen LJM, 2000. Validity of rapid estimates of household wealth and income for health surveys in rural Africa. *Journal of Epidemiology and Community Health* 54(5): 381–7.
- Mtimet N, Baker D, Pica-Ciamarra U & Jagwe J, 2013. Consumer preferences for animal source foods in Uganda: Quality, retail forms and retail outlets. *International Journal of Food System Dynamics* 4(2): 106–16.
- National Bureau of Statistics (NBS), 2010. *Tanzania national panel survey report. Round 1, 2008-2009*. National Bureau of Statistics, Dar es Salaam.
- National Bureau of Statistics (NBS) [Tanzania], 2014. *Tanzania national panel survey report. Wave 3, 2012-2013*. National Bureau of Statistics, Dar es Salaam.
- OECD and FAO, 2013. *OECD-FAO Agricultural Outlook 2013 to 2022*. Paris: OECD and Rome: FAO.
- Pica-Ciamarra U & Otte J 2011. The 'Livestock Revolution': Rhetoric and reality. *Outlook on Agriculture* 40(1): 7–19.
- Pica-Ciamarra U, Baker D, Morgan N, Ly C & Nouala S, 2014a. *Business and livelihoods in African livestock: Investments to overcome information gaps*. World Bank Report Number 86093-AFR, World Bank, Washington DC.
- Pica-Ciamarra U, Baker D, Morgan N, Zezza A, Azzarri C, Ly C, Nsiima L, Nouala S, Okello P & Sserugga J, 2014b. *Investing in the livestock sector: Why good numbers matter*. World Bank Report Number 85732-GLB, World Bank, Washington DC.
- Prasad CJ & Ankiseti AR, 2011. Effect of shopper attributes on retail format choice behaviour for food and grocery retailing in India. *International Journal of Retail & Distribution Management* 39(1): 68–86.
- Reardon T & Minten B, 2011. Surprised by supermarkets: Diffusion of modern food retail in India. *Journal of Agribusiness in Developing and Emerging Economies* 1(2): 134–61.
- Reardon T & Timmer P, 2012. The economics of the food system revolution. *Annual Review of Resource Economics* 4: 225–64.

- Reardon T, Timmer P & Berdegue J, 2004. The rapid rise of supermarkets in developing countries: Induced organizational, institutional and technological change in agrifood systems. *Journal of Agricultural and Development Economics* 1(2): 15–30.
- Tschirley D, Ayieko M, Hichaambwa M, Goeb J & Loescher W, 2009. Modernizing Africa's fresh produce supply chains without rapid supermarket takeover: Towards a definition of research and investment priorities. In *Conference Proceedings, International Livestock Research Institute (ILRI): Toward priority action for market development of African farmers*, 13–15 May, Nairobi, Kenya.
- Upton M, 2004. The role of livestock in economic development and poverty reduction. PPLPI Working Paper No. 10, FAO, Rome.
- World Bank, 2014. Tanzania at a glance. World Bank, Washington DC.