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Animal-source foods in the developing world: Demand for quality and safety

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Animal-source foods offer a cheap source of high quality protein, and essential elements of the diets of the young and other sections of the family. Increased productivity in livestock systems has been seen as a means of combating hunger and malnutrition amongst the world's poor. As the majority of the world's rural poor (and a good number in urban areas) are livestock keepers, such a productivity increase is highly pro-poor.

Rising global demand for livestock products offers opportunities to many poor people working across the livestock food supply chain to earn better incomes. This is being propelled by the growth of incomes and populations, particularly in urban areas, of developing countries.

Developing countries' food delivery systems are often lacking in formal quality and safety control mechanisms, and indeed food-borne disease is a major public health problem in the developing world. Developing country consumers, however, are obviously aware of such hazards, and they and their food suppliers have developed mitigating practises.

Assurance of food safety, as well as information on animal husbandry and the geographic origin of livestock



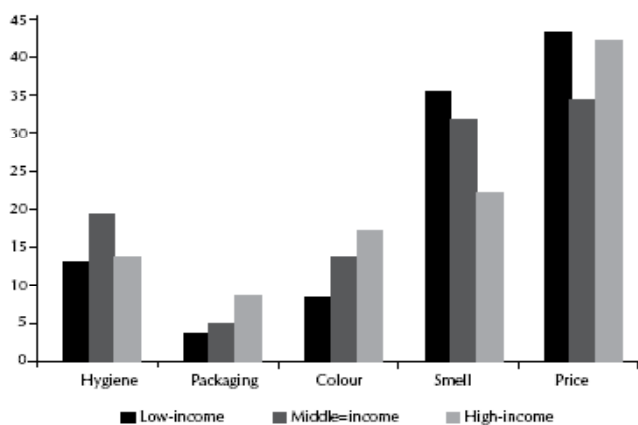
products, have long been recognized as value-adding differentiation mechanisms in the developed world. Anecdotal accounts have suggested that this is also the case in developing countries. Little consistent and rigorously researched evidence, however, had been published on this subject prior to the late 2000s. A 2010 report published by the International Livestock Research Institute (ILRI), Demand for livestock products in developing countries with a focus on quality and safety attributes: Evidence

from Asia and Africa, helped redress this gap by reporting on collaborative research conducted by ILRI and its partners over a number of years on the demand for livestock products in Kenya, Ethiopia, Tunisia, India, Bangladesh, Vietnam and Cambodia.

Where do developing-country consumers buy food and do they care about food quality and safety?

ILRI's work identified "wet markets" (generally open-air formats with minimal infrastructure and often little formal regulation) as the typical place of purchase of meat and dairy products. Quality and safety of livestock food products were mostly defined according to how these attributes are perceived by consumers: by their taste, colour, flavour and smell (see Box 1). These attributes are well catered for in wet markets.

Box 1: Relative importance of quality and safety attributes, and price, of milk in Kenya across income levels (from Makokha and Fadiga (2010))



Developing country consumers also judge quality and safety by what they perceive to be the nutritional attributes of the foods. Across all animal-sourced foods, freshness, absence of adulteration, fat content (milk) and fat cover (meat), and various aspects of appearance were found to be the quality attributes of major interest. They also note how the foods are packaged, their geographic origins, indicators of expired shelf life, a government inspection stamp, and the cleanliness of the premises selling the products. The same consumers are aware of microbial, chemical and physical hazards in animal-source foods. In general, quality and safety issues were not always clearly demarcated: consumers tended to associate some attributes with both while in other cases the differences were more clear.



Do developing country consumers value safe and high quality animal-source foods?

A notable result is that consumers reported basing their judgements of quality on how they intended to use a given food: adulterated milk, for example, was not discriminated against where it was used as an additive to tea, but the opposite is true where it is used in production of confectionery. Overall, the quality and safety criteria used by developing-country consumers were found to closely parallel those used by their developed-country counterparts.

Further influences on quality and safety perceptions were rural/urban and rich/poor divides. Examples include perceptions of fat cover on pork (high quality to rural people and low quality for urbanites) and presence of chemical residues (feared by urbanites but ignored by rural people) (Box 2).

In another parallel with results from developed countries, consumers were found to be willing to pay higher prices for higher quality and safety in milk and meat, and this willingness is particularly strong among the more wealthy and urban consumers. Moreover, urban/rural and rich/poor demarcations were found in quality attributes: awareness and willingness to pay were quite different amongst such consumer groups.

Box 2: Factors influencing willingness to pay for pork with nicer colour and better hygiene, and from pigs reared without industrial feed (from Lapar et al. (2010))

Variable	Nicer colour		Better hygiene		From pigs reared without industrial feed	
	Estimated coefficient	Marginal effect	Estimated coefficient	Marginal effect	Estimated coefficient	Marginal effect
Location dummy (Hai Duong =1)	-1.105***	-0.347***	-0.724***	-0.282***		
Location dummy (Sach=1)	[0.228]	[0.061]	[0.220]	[0.081]		
Income of household	-1.655***	-0.475***	-0.996***	-0.378***		
Market outlet					-0.625**	-0.168**
Buy pork weekly at supermarket	[0.293]	[0.062]	[0.267]	[0.091]	[0.294]	[0.071]
Consumption pattern	0.145***	0.052***	0.116***	0.046***	0.207***	0.061***
Consume beef at least once a week	[0.037]	[0.013]	[0.036]	[0.014]	(0.010)	(0.001)
Satisfied about colour of fresh pork	-1.643**	-0.308***				
	[0.730]	[0.039]				
					0.642**	0.208**
					-0.297**	-0.091**
					[0.139]	[0.044]
No. of observations	596		598		592	
LR chi ²	194.83		108.89		141.96	
Pseudo R ²	0.25		0.131		0.207	

Methods used in ILRI's work have spanned several levels of sophistication, based around surveys of consumers' self-assessment or other statements related to consumption and purchase preferences, in the presence of differential pricing. Remaining challenges include the investigation of consumers' preferences as revealed by behaviour rather than their statements. Choice experiments, and examination of historical purchases offer further advances. Interesting potential research partnerships are offered by retailers and groups of producers seeking to identify their highest valued markets. Further work is needed in characterising demand by traders and producers: these stages of the value chain need to transmit consumer demand, so that producers can respond properly and benefit.

How can producers benefit?

In production and sales of livestock products with attributes for which consumers are willing to pay, producers and other market participants face a number of constraints. Shortages in infrastructure, communication and value chain co-ordination restrict the scope for widespread adoption of standards by which consumers can measure their favoured attributes. Information flows, including donor-sponsored price reporting, tend not to disaggregate by consumers' favoured quality attributes. The informal sector – wet markets and the trader networks that service them – are little affected by quality

assurance advances in export or supermarket-dominated trade. Regulation is poorly suited to informal markets. One-off transactions in the value chain provide few incentives for sustained efforts at targeting and satisfying market niches for quality and safety.

ILRI's work on East African milk markets (see Kaitibe et al., 2008) offers many pointers for the way forward. Official recognition of informal market systems, certification based on training in safety and quality provision throughout the value chain, has allowed significant benefits to flow to both producers and consumers. Extending these results to meat and live animal markets is an on-going challenge being addressed in a number of ILRI's current projects.

Policy implications

Recognition of the informal sector by policy makers, and policy process more generally, has been found to enable smallholders and traditional market systems in delivering quality to market. Quality differentiation on a larger scale will require improved information flows and support for quality standards' development. Such standards will need to be designed, and evolve, in line with preferences and informal market practicalities as outlined here. Extension and training dedicated to skill development are needed, and represent a radical change from tradition. As retail formats change, especially in light of potential supermarkets' growth, regulation and governance in the trading networks will also need to change if access to high value markets is to be available to poor livestock keepers.



Greater co-ordination of value chain actors seems a pre-requisite for delivery to consumers' specifications. Timely delivery can ease spoilage concerns, and collective ac-

tion can address scale-related transaction and processing costs. Advanced forms of payment and cost recovery can cement relationships and secure investment in provision of high quality and safe products. In informal markets these mechanisms are often poorly served by existing organisational models, and prevailing rules and customs. Relaxing these constraints, possibly by enabling interactions between formal and informal markets, and public and private sectors, offer significant challenges to policy designers, and to analysts of the options.

Conclusions

Quality and safety considerations in foods of animal origin provide commercial opportunities for developing-country livestock producers, market actors and industry participants. ILRI's work *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) represents the first attempt to summarize and synthesize results of empirical studies of the preferences of developing-country consumers regarding the quality and safety of livestock food products.

Throughout the value chain, incentives exist for generation of further such information, especially applied to small local and cultural groups of consumers. Similarly, trading and retail formats offer specific contexts for demand estimation. ILRI can maintain leadership in application of advanced methods, and can forge partnerships with public and commercial interests in doing so.

The work concludes that many poor livestock producers and sellers can benefit from serving consumers, some of whom although poor, discriminate in terms of quality and safety and are prepared to pay a premium for foods

they perceive to be safer and of higher quality. However, the extent to which poor livestock farmers and marketing agents can profitably supply safer and higher quality products depends on the policy and institutional environments in which they work. Many challenges remain in getting this right.

Similarly, the extent to which existing, largely informal, livestock trading networks can be used to get higher quality and safer livestock foods to market is also dependent on how much support and infrastructure is provided to small-scale operators, as well as information flows, skill levels, and the development of credence amongst consumers. These conclusions augur well for formulation of market-driven projects and interventions targeting poor consumers, traders and producers.

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On 9 and 10 November 2011, the ILRI Board of Trustees hosted a 2-day 'liveSTOCK Exchange' to discuss and reflect on livestock research for development.

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