

# **The integration of rural households into ruminant livestock industries in China**

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# The integration of rural households into ruminant livestock industries in China

## **Abstract**

A major determinant of rural development in China is the way by which rural households integrate with rural industries. Three forms of integration – market integration, vertical integration and integration through local groups – are investigated. Policy measures that may facilitate household integration, household specialisation and market segmentation are identified. Findings for the ruminant livestock sector are widely applicable to other agricultural industries in China.

Keywords: China, rural development, livestock, markets, vertical integration

JEL codes: Q13, Q18, L1

## **1. Introduction**

China's ruminant livestock sector – composed mainly of the beef, mutton, wool, cashmere and dairy industries – has recorded double digit annual growth for the last two decades, and is expected to continue expanding into the future.<sup>1</sup> This rapid growth creates opportunities for rural development. It enables small rural households to diversify into new activities, and to grow into larger, more commercially oriented, specialised households, or even companies. Many households have also extended

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<sup>1</sup> For details on Chinese ruminant livestock industries see: Longworth and Williamson (1993), Longworth and Brown (1995) and Brown *et al.* (2005) for wool; Longworth *et al.* (2001), Brown *et al.* (2002) and Waldron *et al.* (2003) for beef; and Waldron *et al.* (2006) for sheep meat.

participation in the ruminant livestock industries into off farm activities such as trading and processing.

This sanguine perspective of the implications of the expansion of the ruminant livestock sector for rural development has, however, proved elusive for many households and areas of China. The vast majority of households in the ruminant livestock sector are small, unspecialised and compete in low value markets. Moving up the continuum of scale and commercialisation has not been possible or has involved unacceptable risks for households. As a result, many ruminant livestock raising households have stagnant incomes and are over represented in poverty stricken areas.

A myriad of factors determine rural development outcomes in China,<sup>2</sup> rural livelihoods,<sup>3</sup> or smallholder benefits from livestock production.<sup>4</sup> This paper focuses on the integration of rural households in rural industries as a major factor in rural development. Three inter-related forms of integration are examined: market integration; vertical integration; and integration through local groups. The form of integration adopted in rural industries, and nature of this integration, is determined by the type and value of commodity traded, in combination with institutional and policy settings. The way that institutional and policy settings forge industry and rural development outcomes are under not widely discussed in either the English- or

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<sup>2</sup> Aspects of an “enabling” rural development environment including rural-urban migration and land contracts are discussed in Nyberg and Rozelle (1999) and Sonntag *et al.* (ed.) (2005).

<sup>3</sup> Ellis (1999) argues that rural livelihoods are determined by the “three A’s” of assets, activities and access, which can be interpreted in terms of the relationships between rural households and their rural industries.

<sup>4</sup> Delgado *et al.* (2003) examine the sometimes ambiguous effects that the “livestock revolution” might have on smallholders in developing countries.

Chinese-language literature on the Chinese agricultural economy, or by Chinese policy makers. While necessarily broad, this paper aims to contribute to such a debate.

## **2. Market Integration**

The ruminant livestock sector has undergone far reaching reform over the last two decades. Subsidies for marketing agencies, compulsory procurement, stockpiling, and price controls now play insignificant roles in the sector. While supply chains can be diverse, ruminant livestock industries are totally dominated by a plethora of individual households. As a defining feature of market integration, the vast majority of market transactions are made between these households through private treaty, as spot transactions.

More specifically, livestock raising households are free to choose their activities and respond to market (as well as administrative) signals. These household producers sell livestock or livestock products on farm or in local markets through private treaty.

They sell predominantly to household traders, who on-sell for product transformation (e.g. feedlots, slaughter households or scours) or into a hierarchy of larger and more distant traders. In these marketing chains, most meat is destined for wet markets and most fibre for the lower value processing. Thus, these open Chinese marketing networks are highly deregulated, decentralised and fragmented.

While ruminant livestock markets can be reasonably well spatially integrated,<sup>5</sup> they function imperfectly, especially in terms of product differentiation, and market segmentation. The vast majority of product traded on open markets is low value and generic in nature. A contributing reason is that marketing chains do not adequately

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<sup>5</sup> See Brown (2002) and Rozelle (1997).

reflect the price-grade differentials that downstream customers and final consumers are prepared to accept. For example, many wool textile mills are prepared to pay significant premiums for higher quality wool. However, wool producing households sell their wool to traders on a mixed grade, average price basis.<sup>6</sup> For meat, many consumers are prepared to pay premiums for specific cuts or characteristics of meat, or safety and quality assured product. However, livestock raising households sell to traders solely on the basis of volume (liveweight and estimated dressing percentage).<sup>7</sup>

Broad and sometimes inaccurate product description and subjective measurement means that customers or consumers are uncertain about exactly what they are buying. They therefore seek to minimize purchase risks by paying relatively low prices. The low prices flow back, through traders, to household producers. In addition, ruminant livestock prices also fluctuate widely (Lin, 1997).<sup>8</sup>

This form of marketing system is also more likely to engender opportunistic behaviour, especially from traders. Traders have incentives to purchase from household producers on a mixed grade, average price basis, sort the commodity (even if crudely) and on-sell the produce without passing price-grade premiums back to households. This is possible because traders are much more aware of the preferences of downstream customers and consumers than are household producers (information asymmetries). Households incur significant transaction costs in seeking alternative means of price discovery for different grades of products. For example, households

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<sup>6</sup> After purchasing crudely sorted wool from traders, mills resort wool into industrial grades.

<sup>7</sup> Stalls at some wet markets butcher meat into cuts with differential prices. At the opposite end of the spectrum, meat can be sold in lumps where customers can not recognise the species (e.g. sheep or goat meat) or cuts, and is subject to practices such as the injecting of water.

<sup>8</sup> In Chinese terms, the market is often described as chaotic (*luan*) or unstandardised (*buguifan*). Severe price fluctuations suggest that market signals are not clearly expressed, but are also related to shifts in supply through government programs.

often take cattle to local markets three times before a transaction takes place – and incur even higher search costs in more distant markets. In addition, households are attracted to on the spot payments without delays caused by grading and measurement.

This prevailing market environment for ruminant livestock products has major implications for household producers. In particular, it creates an inertia whereby rational households have incentives to raise generic types of livestock or livestock products for mass markets, and thereby remain as small, unspecialised households working on low or negative returns.<sup>9</sup> The costs of specialisation, expanding production and targeting higher value markets can often not be recouped through higher farm gate prices, and hence represent an unacceptable risk.

In response, government at all levels have encouraged household specialisation through policy measures on the production side. Measures include the subsidisation of household facilities (for example livestock pens and straw ammoniation pits), extension inputs (especially breeding and genetics), credit, and training. As discussed below, the households are often linked up with enterprises or organised into local groups. However, little effort is made to target the production of specific products to specific markets through appropriate marketing channels. This, in large part, is because the government institution responsible for the livestock sector and with direct contact with households – the Animal Husbandry and Veterinary Bureau – is a production oriented institution. Various other institutions also construct “hard” infrastructure such as physical market places and fences.

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<sup>9</sup> In semi-subsistent systems, calculation of household returns are determined largely by the treatment of major cost items such as feed and labour (see Longworth *et al.*, 2001, Chapter 5).

However, far less emphasis is placed in the delivery of “soft” (or intangible) market services that underpin a well functioning market economy. The absence or underdevelopment of these services contributes to the lack of product differentiation and opportunistic behaviour in the ruminant livestock sector. In particular:

- The price reporting system is not disaggregated enough to provide useful commercial information for traders or producers.
- There are no grading systems for meat, while the grading systems for wool and cashmere are barely used in domestic trading.
- There are no mechanisms for processors to systematically feed back information to traders or household producers (from, for example, carcass inspection results or wool grading, testing or processing results).
- There are several schemes that are applied to products that meet defined standards for areas such as production inputs, disease, and hygiene. However, these standards schemes are only used in vertically integrated, enterprise-led chains. Products traded by households on the open market are not incorporated in these schemes. Rather they are subject to public regulations, which are only partially applied and monitored.
- There is little or no monitoring of market conduct at *nongmao* or wet markets, and there is little or no registration or regulation of traders.
- The lack of accurate product description entails difficulties in dispute resolution or contract laws.

Several reasons explain the lack of development of market services in China. Perhaps most importantly, the benefits of providing such services in low value markets are unlikely to exceed the substantial costs involved. At the same time, publicly provided

market services are unlikely to be justified in high value markets, where enterprises seek to differentiate products through their own forms of quality assurance, and where information is generated within the vertically integrated structures. Finally, China has not yet developed the institutional structures that might be able to deliver these services (including the capacity to collect revenues from users of the services).

While the expansion of market services may be uneconomic in low and high value market segments, it may be warranted in the burgeoning mid value market segments. Mid value market segments pose realistic technical demands on the industry, and the supply chains to service these markets are inclusive of household actors, especially specialised household producers and small traders. It may be possible to attract funding (e.g. levies) from these actors to fund the programs. However, there may also be a public good argument for the public delivery of such services, especially given their potential role in promoting inclusive rural development. Public support for the improvement of marketing services is an alternative to the prevailing policy focus on production aspects of the sector.

### ***3. Vertical integration***

Market integration is distinguishable from vertical integration where transactions are internalised within more formalised hierarchies. Several theories explain the existence of vertical integration. Theories from neo-classical economics revolve around market imperfections (such as uncertainty, economies of scale, market power and free riding). Theories from institutional economics focus on transaction costs, including incomplete contracts and relationship specific investment (Joskow, 2005). It has long



been recognised that under conditions of high transaction costs on open markets, firms seek to internalise costs within vertically integrated structures (Coase, 1937). Shorter and more formalised supply chains may also increase capacity to provide continuity and quality of supply.

China's highly imperfect market system acts as one of the reasons for the rapid rise of vertical integration in Chinese agriculture. Ministry of Agriculture surveys reported in Niu (2002), estimated that in 2000, around 25% of China's farmers were "vertically integrated" – widely defined to include household relationships with enterprises, local groups, and specialised physical market places. However, the most common form of vertical integration is contractual relations between specialised households and enterprises. In Chinese terms, households are led (*daidong*) by dragon head enterprises (*longtou qiye*) into marketing chains (the length of the dragon – *yitiaolong*). This form of integration is especially pronounced in high value markets in Chinese ruminant livestock sector.

Vertical integration provides an important means for households to specialise, access higher value and export markets, and to increase incomes.<sup>10</sup> Contracts usually stipulate input (including breeding, feed and veterinary) regimes and output specifications, which are linked to price premiums. That is, price-grade differentials are established at household level. Another incentive for households to enter into vertically integrated structures is that various forms of official and enterprise support are often attached, including the provision of infrastructure, extension services, training and credit.

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<sup>10</sup> Niu (2002) reports that vertically integrated households have significantly higher (Rmb900) incomes than those not vertically integrated.

Despite the potential of the vertical integration model for rural and industry development, it has not proceeded without problems. Enterprises complain that households readily renege on contracts if they are able to get (even marginally) higher prices on the open market, especially if cash is offered on the spot.<sup>11</sup> Households complain that terms of the contracts can be changed by enterprises, especially when they diverge from market prices and developments. Legal structures to resolve contract disputes can be weak at local levels.

As a result of such problems, a shift is taking place from formal contracts to more informal relationships between parties.<sup>12</sup> These more flexible and loose arrangements closely resemble market integration as described in Section 2 above. Local officials say that they are pleased to see the competition between vertically integrated structures (that they have helped to create) and the “normal” market, if it means higher prices for household producers.

A more significant structural problem with the vertical integration program is the way that it is managed at local levels. In particular, dragon head enterprises are commonly promoted and subsidised as the main organisational structure to lead the vertical integration process and to target higher value markets. This is often done from a production led perspective, without sales channels in place. Unviable enterprises and ill conceived marketing can have disastrous consequences for households that invest

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<sup>11</sup> Households can wait significant periods of time for payment after delivery of product through vertically integrated structures. In the case of fine wool, the households are paid on the basis of test results and auction prices, while payment for high-value livestock can be made after slaughter on the basis of carcass measurements.

<sup>12</sup> For example, an abattoir or fibre marketing agency will inform an intensive livestock production area (township or village) of its requirements, and buy from the area when the product is ready.

and specialise to integrate with the structures, which they are encouraged to do by local administrative and extension systems.

The strong government support afforded to the vertical integration program also raises a range of broader social questions. Scarce local resources diverted into the vertical integration program could otherwise be used for local activities that affect a wider number of households, or for poverty alleviation schemes targeted directly at poor households. It can also be argued that services with a strong public good component – such as market services and extension – are under resourced because there is an expectation that these will be provided by or through enterprises and vertically integrated structures. For example, grading, food safety and export standards are applied through enterprises, rather than as public goods accessible to a wide range of actors. In this case, it may be that a gap between vertically integrated, specialised households (on the one hand) and market integrated, unspecialised households (on the other) will grow in a “dual development” scenario. The emphasis on larger scale actors (such as feedlots) may also crowd out smaller households producing the same sort of livestock.

#### ***4. Local group structures***

Another way for households to integrate with their industries is through participation in the many and varied forms of local groups, including associations, co-operatives, “small livestock raising areas”, or specialised townships and villages. These local groups act as an intermediary organisation to facilitate the entry of households into industries. They help in assembling the products of many small households into larger lines or lots of homogeneous product required to service higher value markets.

Economies of scale and consistent practices also apply to production inputs and

services, and to programs such as disease control. Links with local groups is almost a requisite for the establishment vertically integrated structures. Local groups also increase the bargaining power of participants, including vis-à-vis enterprises. Market integrated households sometimes operate in clusters (specialised villages) to build economies of scale and scope (for example into slaughter, cold storage and trading).

Shen et al. (2004) estimate that in 2003 only about 3% of households in China were members of “Farmer Professional Associations”, which are a relatively tightly defined form of local group. Livestock was the most highly represented sector, within which (beef and dairy) cattle and (meat and wool) sheep were amongst the most highly represented industries in proportion to their size.

However, much higher proportions of households are involved in other forms of local groups that are specialised in particular industry activities. For example, some counties and cities in the Central Plains of China have hundreds of villages specialised in beef cattle production – defined in terms of per capita cattle numbers, but also involving co-ordination in inputs and marketing. A more formal form of organisation known as “livestock small areas” (*yangzhi xiaoqu*) have grown in importance across China. In Chifeng Prefecture in Inner Mongolia in 2003, more than 30% of all livestock are raised in small areas (including 200 sheep producing “small areas” comprised of more than 6000 specialised households) and there are plans to increase this number to 70% by 2008.

Problems also arise in the development of local groups. First, even with a broad interpretation of “local groups” to incorporate informal, intensive production areas

within administrative borders, they are under represented in Chinese agriculture, particularly when compared with other countries such as Japan and South Korea at comparative levels of development. Second, local groups are often initiated by higher levels of government – often in co-ordination with enterprises – while local leaders play a major role in the ongoing functioning of the groups. That is, local groups are easily captured within (profit oriented) corporatist structures. Third, few of the local industry groups are run on genuine co-operative principles, in a bottom-up fashion.

There are various reasons for the under development of the local group structures in China. It is often claimed that households are reluctant to enter into co-operative activities because they are associated with the excesses of the collective era. However, high level institutional structures do not help the situation. The Party-State discourages structures that facilitate the organisation and representation of rural groups. In 2005, a Co-operative Law had been drafted and its' passing into law may help to clarify the legal status of local groups. In particular, it should enable groups to register as a genuine co-operative, enter into contracts as legal entities, and take out loans – all of which are not possible at present.

## ***5. Conclusions***

The diversification of China's rural economy – through the development of multiple forms of rural households, that integrate into multiple forms of marketing channels, and that service multiple value market segments – bodes well for industry and rural development prospects. However, as discussed in this paper, some institutional arrangements and policy settings constrain and bias the process. In some cases, these constraints can be minimised by reducing emphasis on production-push policy measures to promote industry and rural development. At the same time, there are

areas where more government involvement is required in the delivery of public goods.

An improved appreciation of the way that rural households integrate with rural industries may help in the development of these institutional and policy settings.

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