

6 Where Did the Animals Go?

Presence and Absence of Livestock in Chinese Agricultural Treatises

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It has been widely argued that animals – both wild and domestic – began to vanish from the landscape very early in Chinese history.¹ From the Han dynasty onward, as the Chinese imperium expanded, so too the intensive, crop-centred farming methods initially developed in the heartlands of the Central States spread into new territories. The land around newly sinicized population centres was cleared and reclaimed until every inch of cultivable soil had been turned over to intensive crop production, leaving no place for pastures or woodlands where animals could graze. Landless peasants would migrate to underpopulated regions, beginning anew the process of intensification. Indigenous groups who had hitherto raised cattle or lived by hunting were either driven up into the mountains, or ‘civilized’ and converted to Han Chinese intensive farming practices. In consequence, according to the prevailing view, livestock have long played only a minor role in Chinese farming systems. Chinese farmers relied on plant manure and crop rotation as much as dung; in place of animal fats and meats they consumed plant oils, vegetables and beancurd. Only in borderland zones, or in mountainous regions, marshlands, steppes or deserts that were considered unsuitable for arable farming, did livestock raising remain a significant economic activity over the centuries.

This is a narrative that, until recently, I too had accepted without question.² My primary evidence was the long and voluminous tradition of Chinese treatises on farming, *nongshu* 農書, which – at least at first reading – appears to offer unequivocal support for this view. In stark contrast to the European tradition of agricultural writing, where written texts from classical antiquity through to the modern era faithfully reflect the ubiquity and economic importance of mixed arable and animal farming, only one Chinese *nongshu*, the sixth-century CE *Qimin yaoshu* 齊民要術 (Essential Techniques for the Common People), features livestock as an integral and essential element of

¹ E.g. Cartier (1993); Elvin (2004). ² Bray (1984), 3–5.

a mixed-farming system, containing long, detailed chapters devoted to each of the common domesticated animals. In later works, apart from the ubiquitous silkworm, most types of livestock are typically treated cursorily, or referred to only in passing.³

But how closely does this apparent neglect of livestock in Chinese *nongshu* correspond to the realities of diet, clothing, commerce and rural livelihoods in pre-modern China? And does the *nongshu* evidence, if viewed in a broader context, really demonstrate a steady decline in the importance of animals? Even if they devoted little space to the details of raising cattle, pigs or sheep, almost every *nongshu* writer found room to quote Lord Tao Zhu 陶朱公: 'If you want to get rich quickly, you should raise the five kinds of breeding stock.'⁴ Yet, with the exception of the *Qimin yaoshu*, the typical *nongshu* chapter on 'raising livestock' (*yang chu* 養畜) was brief, composed principally of quotations from earlier works, with a few additional lines of newer information and advice. But we also typically find references to livestock scattered through other sections: in discussions of tillage, illustrations of animal-powered equipment, remarks on using crops like taro, sweet potato or purslane, or manufacturing by-products like soy-cake or brewing-mash to fatten animals up for the table or for sale. So, reading between the lines, we can discern a continuing role for livestock within crop-centred farming, even in late imperial *nongshu*.

While other Chinese historical sources support the general view that animals occupied less and less of the rural landscape over time, they too yield evidence suggesting that the role of livestock, while minor compared to Europe, remained essential right into the modern era. The importance of animals in Chinese rituals and diet, economy, culture and science is currently undergoing an interesting reassessment. Several chapters in this volume address animals in state policy. Elsewhere, Vincent Goossaert, in a discussion of the moral dialectics of different Chinese vegetarianisms, links the aversion to eating beef that first became evident during the Song dynasty not only to religious injunctions but also to the increasing predominance of small family farms, where draught animals were considered part of the family. Tracing how Jinhua ham rose to fame and fortune during the Ming and Qing dynasty, Chunghao Pio Kuo collates information on the stock-raising, preservation and distribution practices that developed from Song times on, to supply steadily expanding markets

³ This chapter will not address silkworms, which figure prominently in most Chinese agricultural works, or fish, which appear in many.

⁴ See this remark as quoted in *Qimin yaoshu*, 2; [*Wang Zhen*] *Nongshu*, 58; and *Nongzheng quanshu*, 1139, respectively. Lord Tao Zhu was the name taken after retirement by Fan Li 范蠡 (sixth century BCE), the famous statesman and entrepreneur of the Warring States period; today he is celebrated as an expert on profitable business management (the breeding of capital).

for regional meat delicacies. Although the *nongshu* are largely silent on this theme, Kuo is able to glean materials from poetry, gazetteers, recipe collections and works on *yangsheng* (養生) ‘life-nourishing’.⁵ Françoise Sabban depends on a similar spectrum of sources to trace the historical evolution of milk consumption by Chinese elites, from the yoghurts and goat cheeses in the *Qimin yaoshu* to recipes for cow’s milk puddings in eighteenth-century compendia on health and diet.⁶

It is in the context of this more nuanced scholarship on the place of farm animals in Chinese livelihood, diet and culture that I offer the following reflections upon what the authors of *nongshu* did and did not write about livestock, what may have shaped their choices, and how they represented different animals. I examine four landmark works spanning the period from the sixth to the eighteenth century, the *Qimin yaoshu* (c. 540) by Jia Sixie 賈思勰, the *Nongshu* 農書 (Agricultural Treatise) of 1149 by Chen Fu 陳旉 (1076–1154), the *Nongshu* 農書 (Agricultural Treatise) of 1313 by Wang Zhen 王禎 (fl. 1290–1333) and the *Binfeng guangyi* 邇風廣義 (Explanation of the Customs of Bin) of 1741 by Yang Shen 楊屺 (1699–1794). Rather than simply taking absence or presence in the text to reflect absence or presence on the farm, I ask how the authors of these *nongshu* decided which animals to include in their treatises, and what they considered useful to say about them.

Husbandry in Chinese Farming: A Brief Historical Survey

In accepting that livestock progressively disappeared from Chinese farming landscapes, perhaps I – like other historians and agricultural economists – was led to exaggerate the unimportance of livestock in late imperial Chinese farming systems because of the striking contrast with the landscapes and histories that surrounded me in Britain or France where I grew up. In traditional European mixed-farming systems, animals and crops were symbiotic. People’s basic diet included cheese, bacon and lard, as well as bread or porridge. Fields of waving corn depended not just on horses or oxen to pull the ploughs, but also on flocks of cattle or sheep grazing on the stubble to manure the land. The structural complementarity of crops and livestock was omnipresent. Improvements in cereal farming were almost invariably understood as being interdependent with better livestock management techniques. Townshend’s famous turnips, for instance, allowed farmers to raise more sheep and, thus, increase their yields of wheat and barley – thereby launching the eighteenth-century ‘agricultural revolution’ in Britain.⁷ It is only very recently that mixed

⁵ Goossaert (2005a), (2005b); Kuo (2013). See also Xu Wangsheng (2009), 108–17, 152–5.

⁶ Sabban (1986). ⁷ Kerridge (1967).

farming has come to be viewed as less effective than specialization across Europe.⁸

In China, however, practice, preference and principle were apparently quite different. The preference for crops over animals dates back a long time: we can trace the basic principles of crop-focused, cereal-intensive farming at least back to the Warring States. There was, however, an interlude of several centuries, at least in northern China, which Michel Cartier dubs ‘the Golden Age of animals’.⁹ From some time during the Han dynasty until after the Tang, Chinese incursions into Central Asia and successive waves of invasion by nomadic peoples, many of whom settled and intermarried with Chinese families, led to what we might call a ‘pastoral turn’ in northern China. The *Qimin yaoshu* provides valuable insights into the importance of flocks of sheep and goats, as well as the dairy products, mutton and goat that featured prominently in the diet of that period. It seems that, by the early sixth century, when the *Qimin yaoshu* was composed, Han and Tuoba tastes and practices were thoroughly intermixed, from the elite to the peasantry.¹⁰ This hybridization of taste, diet and farming systems apparently did not recur under Khitan, Jurchen or Mongol rule. In those later periods of nomadic conquest, it seems that the occupiers were anxious to restore classic Chinese farming patterns in regions which had been devastated by war or by attempts to use the land for pastoral herding.¹¹ Certainly, the large estates which predominated in north China through much of the medieval period, when the *Qimin yaoshu* was composed, offered unique and unrepeated scope for mixed farming including rearing and using an uncharacteristic abundance of livestock. As the large estates were finally suppressed, and smallholding confirmed as the approved norm, the huge flocks of sheep and teams of oxen characteristic of manorial farming likewise disappeared from the scene.¹²

Generally speaking, ‘sedentary Han Chinese abhorred barren land that produced no grain. In their view rangeland was no more than “wasteland” (*huangdi* 荒地) that needed to be reclaimed and cultivated’.¹³ Pastoral and agrarian livelihoods and patterns of land use were typically seen by officials as categorically distinct, incompatible rather than mutually sustaining.¹⁴ At least on their borderlands, Han Chinese officials tended to view pastoral practices as inherently destructive and wasteful.

⁸ Hartung (2013), 28–32. ⁹ Cartier (1993), 12–13. ¹⁰ Dien (2007); Sabban (1986).

¹¹ E.g. Kubilai’s establishment of agricultural bureaux and commissioning an official handbook to improve farming, the *Nongsang jiyao* 農桑輯要 (Compiled Essentials of Agriculture and Sericulture).

¹² Bray (1984), 587–97; Xu Wangsheng (2009), 126–9. ¹³ Ho (2000), 348.

¹⁴ One reason for this view may be that Chinese governments organized the breeding of essential animals, whether it be the warhorses needed for defence, or the oxen needed by peasants as draught animals, as large-scale state enterprises; farming, on the other hand, was officially understood and managed as a small-scale peasant activity.

But there are, in fact, three basic types of livestock management, and we should be wary of conflating nomadic pastoralism with mixed farming, or with raising livestock in stables or pens. The herds of pastoralists are constantly on the move, ranging over large swathes of territory – much of which would not support arable farming; but nomadic circuits often include regular passage through farm settlements, exchanging manure and other animal products for pasture and grain. Mixed farming operates within a locality: animals are attached to a specific farm or community. Sometimes the beasts may be sent up to summer pastures, otherwise they will graze locally in pastures or meadows belonging to the farm, or in commonly held woods and heaths. They are turned out onto harvested fields or fallows to manure the land, but have to be stabled and given fodder in the winter. Where fodder is in limited supply, many animals will be slaughtered rather than fed through the winter, and their meat preserved for long-term use. In the third form of livestock management, animals are kept in stables or pens all year round and only turned out to forage or graze on rare occasions, if at all. Though pigs and poultry thrive when allowed to roam, they also do well when kept in sties or farmyards. Cattle can also be reared in stalls, but sheep and goats need access to pasture to thrive. There is obviously considerable overlap between these three systems, but I think the distinctions are helpful to bear in mind as we consider changes in livestock management in China over time.

Certainly, by the end of the imperial era, there was little room left in the main arable regions for pasturing livestock. Like other early twentieth-century studies, the monumental survey of farming and land utilization in China which John Lossing Buck and his colleagues at the University of Nanking undertook in the late 1920s and early 1930s found that 27 per cent of the total heartland area was cultivated land, 8.7 per cent was forest and 4.6 per cent pastures (a vast 60 per cent was unused or unusable); 90 per cent of the farmland was arable and only 1 per cent was meadow or pasture.¹⁵

This was not a new phenomenon. In northern China, both the size of farms and capital resources steadily decreased after the medieval period. Goossaert suggests that large-scale herding dwindled steadily and meat-eating declined, along with the disintegration of the northern aristocratic manorial system.¹⁶ From the mid-Tang on, successive governments clamped down on large estates that could afford teams of draught animals and mixed farming. In consequence, after its medieval heyday, what Philip Huang calls ‘managerial farming’ – that is, farming on a larger scale and with more opportunities for combining animal husbandry with cropping, permitting the rationalization and investment of capital and other resources considered fundamental to northwestern Europe’s ‘agricultural revolution’ with its

¹⁵ Buck (1938), 5–6. ¹⁶ Goossaert (2005b), 241.

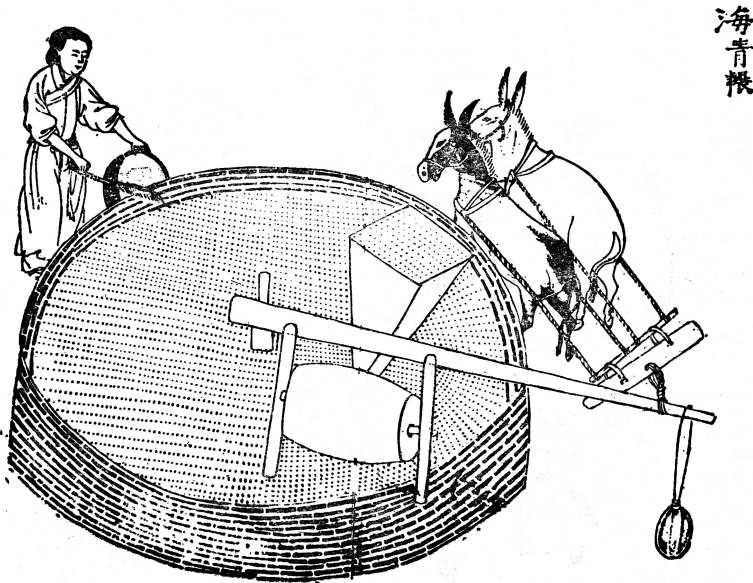


Figure 6.1 Grain-mill powered by two mules. Illustration from [Wang Zhen] *Nongshu*, 'Nongqi tupu' 9, 284.

notorious enclosures – never took off in northern China.¹⁷ Similarly, in the rice regions of southern China, the diffusion of highly intensive 'skill-oriented' cropping systems ensured a historical trend towards small-scale farming.¹⁸ Nevertheless, it seems that farmers in most regions of China managed to keep a pig and some chickens in their yard, along with a draught animal or two, whose diet consisted of rough grazing scantily supplemented with beans or mash, and with fodder that children cut from verges or ditches. Oxen, mules and donkeys, often used in pairs, were the common draught animals of the north; in the south, a single water buffalo was typical.

Sometimes there were just not enough draught animals to work the fields and turn the mills: a whole region might be struck by drought or pestilence, while in every community there would be poor families that could not afford to keep their own oxen. Substituting human labour for draught animals was viewed by the state as a desperate measure, but not everyone agreed. By the late Ming, in a highly productive region like Huzhou 湖州 in Zhejiang province, which was

¹⁷ Huang (1985). ¹⁸ Bray (1986), 113–23; Li Bozhong (1998), 39–42.

famous for its high-quality silk, ten *mu* (about 0.6 ha) of rice land was considered the optimal farm size. Writing probably in the 1650s, the farming specialist Zhang Lüxiang 張履祥 (1611–74) compared farming techniques in two adjacent counties, Gui'an 歸安 and Tongxiang 桐鄉 just outside Huzhou. In Gui'an, farmers worked the soil with buffalo-drawn ploughs and harrows but, although Tongxiang was only a few miles away, farmers there worked the fields with hoes because the land was low-lying and damp.¹⁹

A few years earlier Song Yingxing 宋應星 (1587–1666) wrote that 'the peasants of Suzhou Prefecture do not use buffalo but use hoes instead of ploughs. I reckon that for poor farmers, the expenses involved in buying and feeding the beasts, without mentioning the risk of theft, sickness or death, amply justify their preference for using human traction.'²⁰ Song does not discuss hiring animals but Perkins notes that, in the 1930s, this was a resource – and a valuable service – for landless households: 'Oxen and water buffaloes were expensive and poorer farmers often did not own them. But they could rent them.'²¹ Raising draught animals for hire was not a very secure source of income, however, since it depended on neighbouring farmers having money to spare. In times of stress, poorer households in such villages 'were forced to abandon animal husbandry altogether, whereas others switched to rearing smaller animals'.²²

In addition to local, private markets for draught animals, throughout imperial history we find records of official projects (whether local or large-scale) which were intended to ensure adequate supplies. On state agricultural colonies – an institution that lasted from the Han dynasty to the nineteenth century – the government usually aimed to provide one draught animal for every two households.²³ But where were the animals distributed by the state raised? While Mongols, Tibetans and other Central Asian border groups were well known as pastoralists, let us not forget that many non-Han groups across southern China shared the characteristic Southeast Asian cattle culture, in which livestock rearing and crop production formed an integrated mixed farming system. A typical example is described by the seventeenth-century observer Qu Dajun 屈大均 (1630–96), who tells us that the inhabitants of Lingnan 嶺南 and Annam 安南 'devote themselves to agriculture and stock raising, and reckon their wealth according to the fruitfulness of their cattle'.²⁴

The central provinces practised a crop-intensive form of agriculture from which herds of animals had largely disappeared, yet within this ecosystem most households could usually support the one or two draught animals upon which their livelihoods as crop-farmers depended. Meanwhile, in response to animal

¹⁹ *Bu nongshu*, 101. ²⁰ *Tiangong kaiwu*, 20. ²¹ Perkins (1969), 188.

²² Brandt and Sands (1992), 192. ²³ Cartier (1993), 13.

²⁴ *Guangdong xinyu* 廣東新語 (New Accounts of Guangdong), quoted in Bray (1984), 509. For other examples drawn from sources including the Miao Albums, see Hostetler (2007).

epidemics, draught animals could be brought in from fringe regions which practised either pastoralism or integrated herding and arable systems. The latter, like European mixed-farming regimes, were settled farming systems, with an animal–crop synergy that might well have appealed to the author of *Qimin yaoshu* as good practice. By late imperial times, however, orthodox Han officials – who evaluated the benefits of a farming system primarily in terms of the staple grains produced – dismissed these mixed-farming systems as woefully underproductive.²⁵

Let us turn now to the question of diet. The *Qimin yaoshu* was unique among *nongshu* in giving prominence to milch animals and dairy products. In later *nongshu* milk disappears. Bovines and equines figure only as working animals. The entries on sheep and goats are typically reduced to a few columns of text, suggesting that they were of little importance beyond providing occasional meat for family use or sale. Pigs, likewise, typically garner just a few lines, as do poultry. ‘Chinese peasants’, writes Philip Huang, ‘have long been vegetarians, not by choice, but by the dictates of the Chinese agrarian system.’²⁶

No doubt Chinese peasants, like peasants or farm-labourers the world over, considered themselves fortunate if they could afford a few chunks of meat at festivals. But what about producing meat for sale? When well-off families wanted meat or milk, how freely was it available? Although Song and later *nongshu* would seem to support the view that meat-eating, along with raising livestock, declined after a medieval heyday, a multitude of sources dealing with consumption – whether of medical or religious dietetics, celebrations of elegant or lavish lifestyles, recipe books or works on connoisseurship – indicate that, for well-off families and urban populations, vegetarianism was a choice, not a necessity.

Beef disappeared from most people’s diets as early as the Song for a complex tangle of reasons: changes in farm size and management techniques; the disappearance of herding from arable regions; an increasingly close bond between small farmers and their draught animals; moral injunctions (Confucian and Daoist as much as Buddhist) against devouring the animals upon which rural livelihoods depended; and a shift in sacrificial practices.²⁷

Citing literary works and recipe collections from Song through to Qing, Kuo suggests that mutton or goat were originally, and remained, typical of northern China’s cuisine. As the south outstripped the north in population size and wealth, these meats dwindled in importance compared to pork, poultry and fish. Yet, it is clear from the list of local breeds or types cited in the *Binfeng guangyi* that sheep were still bred for meat, and sometimes also for wool, in almost every region of eighteenth-century China.²⁸

²⁵ Bray (1984), 509–10. ²⁶ Huang (1985), 61. ²⁷ Goossaert (2005a).

²⁸ Kuo (2013), *passim*; *Binfeng guangyi*, 3.25–6.

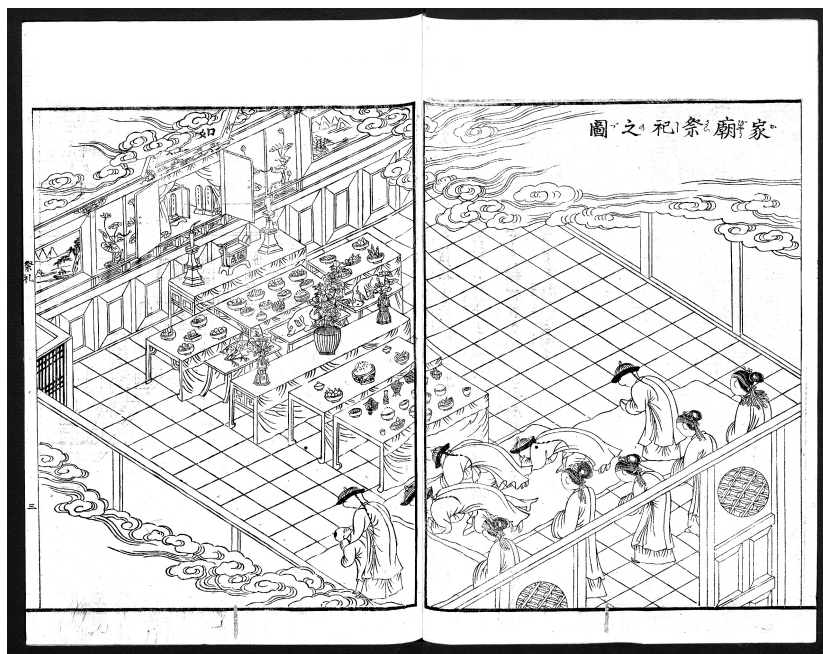


Figure 6.2 Grand ancestral sacrifice, with a pig and a chicken as offerings. Nakagawa Shundai (ed.), *Shinzoku kibun* [*Recorded Accounts of Qing Customs*], Tōto [Edo], Nishimiya Tasuke, Kansei 11 [1799] shinsen, 12.2a–3b. Online resource, *Staatsbibliothek zu Berlin – PK*, <http://resolver.staatsbibliothek-berlin.de/SBB0000B38700000000>

One marked difference between the early and late imperial diet was a rise in the popularity of pork. Pork had always featured in every Chinese region's cuisine, but Kuo argues that late imperial urbanization favoured its consumption because, unlike range-animals, pigs could be conveniently raised in suburban settings. Indeed, they were often fed by-products of urban or suburban manufacturing such as oil-seed, soy-cake or the mash left over from brewing. As early as the Southern Song, the Hangzhou meat market already had 'countless meat stores', slaughterers killed hundreds of pigs every day, and their meat – raw, cooked or processed – flew off the shelves. The expansion of peri-urban pig farming accompanied a rapid rise in demand for both raw meat and processed pork (from pickled tripe to ham), accompanied by a steady increase in both popular and refined recipes for pork or pork-flavoured dishes. It was not only the living who enjoyed this abundance of pork: cattle and sheep disappeared from sacrifices during the Ming and Qing, to be replaced by pigs and poultry.²⁹

²⁹ Kuo (2013), especially 218–20; Goossaert (2005b).

While pork's popularity increased so much that the word became synonymous with meat, beef vanished from most tables. Yet – though it never became a staple source of protein for the poor as it did in Europe – cow's milk apparently retained favour among late imperial gourmets and hypochondriacs. Sabban suggests that there was a shift in tastes for dairy products around the Song dynasty: sheep and goat's milk came to be considered rank, but imperial courts from the Song to the Qing kept small dairies, and late Ming dietetic-medicinal works from southern China warmly recommend 'nourishing custards', which were delicate dishes prepared from cow's milk, eggs and sugar. Sabban suggests that elite families might keep a single cow in a stall inside their mansion, much like a pet cat.³⁰ More generally, Sabban suggests that livestock may have become invisible in the landscape without being absent from the farm: instead of foraging or grazing outside in the warmer months, pigs, sheep and even milch cows were kept permanently penned, stied or stalled, bringing welcome income to the farmer and culinary delights to consumers.

Livestock in *Nongshu*

Having outlined the historical context within which *nongshu* were embedded, I now turn to the works themselves, to reassess what we might learn from them about the significance of husbandry and the importance of animals.

In his meticulous historical bibliography of agricultural writings, Wang Yuhu lists the titles of eighty-one works devoted specifically to livestock, their care and their diseases.³¹ Of these, only thirteen remain extant, though passages from several others survive in quotations; the titles and/or surviving texts indicate that the principal theme of these specialized works was assessment or physiognomy (*xiang* 相) – that is, gauging an animal's qualities or state of health by outward signs – as well as diagnosing and treating diseases. The genre seems to have been very popular in early times, and to have undergone something of a revival in the late imperial period (related, no doubt, to print culture and to the expansion of the meat industry). Of the eighty-one titles Wang lists, forty-five deal with horses and twenty-one with bovines; only two (one very early and long lost, another from late Qing) deal with pigs and six discuss sheep and goats. I offer some explanations for the bias towards horses later. We might have expected to find some works devoted to livestock among late imperial specialist monographs, *pulu* 譜錄, but Siebert's analysis indicates that, by that time, even horses were not considered sufficiently glamorous or exotic to warrant such attention.³² For pragmatic instructions on how to breed, feed and care for livestock, we need to turn to the general *nongshu*.

³⁰ Sabban (1986), 49, 54. ³¹ Wang Yuhu (1979), 319–22. ³² See Chapter 7 in this volume.

***Qimin yaoshu*: Northern Herds and Estate Management**

The classic example is the *Qimin yaoshu* by Jia Sixie, already mentioned several times. This sixth-century work was composed at the height of the 'Golden Age of animals', during the heyday of the manorial enterprises that typically raised large numbers of livestock for both profit and pleasure.³³ Like other literary or technical works of the period, by the beginning of the print era in the Song, large chunks on tillage techniques, specific crops or processes were quoted verbatim, or paraphrased, in almost every work claiming agronomic authority. The sections on livestock were no exception: faithfully reproduced or sliced and diced, selected passages from these chapters reappear as the backbone of the livestock sections in almost all later *nongshu*. Since no later work offered such a comprehensive treatment, what is included and omitted merits reflection.

The *Qimin yaoshu* is a vast work, totalling 10 *juan*. *Juan 6* (chapters 56–61) is devoted exclusively to livestock, their care and the processing of their products. Chapter 56 addresses cattle, horses, donkeys and mules (working animals). Chapter 57 covers sheep and goats (*yang* 羊), dairy products and breeding livestock. Chapters 58 to 61 deal respectively with pigs, chickens, geese and ducks, and fish. Although he quotes extensively from earlier literature, including numerous works on physiognomy, many of the materials included in Jia's treatment apparently come from his own experiences of keeping livestock.

The *Qimin yaoshu* is unique among *nongshu* in its concern with milch animals. It features an extensive range of dairy products, and it has attracted much scholarly attention as almost our only source of information on what is often treated as a dietary interlude in Chinese history.³⁴ Jia Sixie was writing at a time when the Tuoba Wei 拓跋魏 had ruled northern China for over a century, and foodstuffs derived from the milk of ewes and goats, mares and cows were very popular. Jia describes the preparation of many dairy products that disappeared from the Chinese diet in later dynasties, including forms of fresh and smoked yoghurt and curd, cheese and fresh or clarified butter. While some dairy products were eaten fresh, others kept for months and could be enjoyed through the winter or carried on long journeys.

The sections on herding sheep in the *Qimin yaoshu* suggest that shepherds drove their flocks through large swathes of woodland or heath, continually on the move to avoid over-grazing or contaminating streams. In winter the flocks were penned in on the estate, and a wise manager laid in plenty of fodder for them. This, then, was not nomadic pastoralism but mixed farming, necessitating calculations for balancing numbers of livestock against the land available to

³³ Bray (2013), chapter 2; (forthcoming). ³⁴ Sabban (1986); Huang (2000); Harper (2002).

grow fodder. Jia Sixie confesses that, before he understood their needs, he had a flock of two hundred sheep which, to his dismay, all gradually starved or fell sick; he later realized this was for want of sufficient beans to feed them over the winter. Jia advocates sowing one *qing* (roughly 6 ha) of soybeans for every thousand head of sheep, which indicates the scale that he envisaged as manageable.³⁵

The chapter is full of pragmatic advice.

As a general rule, two out of every ten sheep should be rams (if there are fewer rams not all the ewes will become pregnant, and if there are more the flock will be unruly) . . . Sheep intended for the table should be castrated. (When they are ten days old or so, wrap [the testicles] in a cloth [tightly enough] to cut through the blood-vessels and crush [the testicles])³⁶ . . . Inside the pen make palisades of vertical bundles of brushwood right round the walls. (If the sheep can't brush directly against the earth walls of the pen, then their coats will keep naturally clean)³⁷ . . . When milking you must have someone measure the milk: one part in three should be set aside and given to the lamb or calf. If you take the milk too early or do not leave a third for the lamb it will grow thin and die³⁸ . . . The setting of yoghurt depends on maintaining the right degree of warmth: if you keep it just warm, slightly higher than body temperature, this is exactly right. If the yoghurt is kept too hot it will become acid, and if it is too cold it will not be firm.³⁹

Jia Sixie is describing an enterprise where all kinds of products and produce are bought and sold.⁴⁰ Some of the sheep were raised for the table and some of the dairy products (produced fresh in large quantities when the milk supply was at its height and then processed into products that would last for weeks or even months) would have been consumed on the estate, and others sent to market. Following Lord Tao Zhu's precept, quoted earlier, that raising animals is a source of wealth, Jia treats sheep as capital on the hoof: 'At the beginning of the harvest in the eighth month often there are no workers left with free time, so one should sell some sheep to hire some men.'⁴¹

I do not know what symbolism, if any, sheep might have carried at the time the *Qimin yaoshu* was composed. Overall, as the quotations above indicate, the chapter on sheep is straightforwardly factual. Yet, although we are far from the heavy symbolic load of sheep, shepherds and flocks characteristic of the Judeo-Christian tradition, I find it interesting that Jia Sixie emphasizes the ideal character traits of a shepherd: 'The shepherd should be an old man, tractable by nature, able to judge properly when to lead his flock on and when to remain – no different from "shepherding the people" (*mu min* 牧民).'⁴² 'Shepherding the people' was, of course, the duty of officials – so were they also supposed to be

³⁵ *Qimin yaoshu*, 313–14. ³⁶ *Qimin yaoshu*, 312. ³⁷ *Qimin yaoshu*, 313.

³⁸ *Qimin yaoshu*, 315. ³⁹ *Qimin yaoshu*, 316. ⁴⁰ Bray (forthcoming).

⁴¹ *Qimin yaoshu*, 314. ⁴² *Qimin yaoshu*, 312.

strong but biddable, as well as good judges of a situation, just like a good shepherd?

As well as raising animals for milk, wool and meat, an estate like Jia's also relied heavily on draught animals – mules and donkeys, as well as oxen. Horses too figure prominently in the *Qimin yaoshu*: it was written at a time when the elite liked to ride horses for pleasure or everyday travel, as well as needing them for military purposes. Most of the long chapter that is supposedly devoted to 'cattle, horses, donkeys and mules' consists of advice for evaluating a horse – by its teeth, its proportions, its markings or the colour of the inside of its mouth, and of prescriptions for curing the many illnesses that horses are prone to suffer. Delicate and unreliable, in times of peace horses were likely as much an indulgence for the northern elite of the period as they were for devotees of fox-hunting in Victorian England. Jia notes that mules are much better than horses for farm work, because they are larger and stronger animals.⁴³ Nevertheless, mules and oxen are hardly mentioned in comparison to horses.

Where horses are concerned, Jia Sixie offers his readers a cornucopia of special terms to roll around the tongue, and body parts to visualize – traits that an expert needed to identify, scrutinize and evaluate before purchasing or selling an animal. We are two-thirds into the chapter before Jia – an author who normally crams each chapter with precise and practical technical instructions – gets round to telling us how to feed the beasts, and after just a couple of paragraphs he moves on to cures for common problems. Donkeys, Jia tells us (and, by inference, mules too), 'are just like horses, so I shall not write a separate section on them'.⁴⁴ The final section of the chapter goes through the same topics, but much more briefly, for oxen/cattle.

Paintings and bas-reliefs of the period show that oxen and mules were the animals upon which efficient estate farming depended, and overall the *Qimin yaoshu* is a pragmatic work that prioritizes productive methods and the effective use of resources. So how can we explain the chapter on cattle and horses? It is almost a romance of the horse, rather than a handbook for keeping healthy draught animals. Discussing the recipes included in the *Qimin yaoshu*, Donald Harper suggests that reading a recipe may often have evoked as much pleasure as consuming the dish.⁴⁵ Similarly, perhaps we may infer that Jia Sixie structured his chapter on 'cattle, horses, donkeys and mules' to appeal to the literary imagination and elite tastes of the time.

I will not go into any further detail here on how livestock are treated in the *Qimin yaoshu*, except to note that the chapter on pigs is very short, consisting of

⁴³ *Qimin yaoshu*, 285. ⁴⁴ *Qimin yaoshu*, 286.

⁴⁵ Harper (2002). Hundreds of southern or central Asian grains, fruits, vegetables and spices are listed in Book 10.

about one-quarter of quotations from other works, and three-quarters of practical instructions by Jia Sixie. Perhaps pork was less important than mutton in diets – or, at any rate, elite diets – of that era. Yet it is curious that in later *nongshu*, in periods when pork was synonymous with meat for most Chinese and when pig manure was as valuable as pork meat on smallholdings, pigs nevertheless receive quite cursory treatment compared to other animals – in fact, most authors simply paraphrase excerpts from the *Qimin yaoshu*. Did elite writers consider pigs beneath their dignity?⁴⁶

Southern Song Agronomy: The Peasant, His Rice-fields and His Ox

Let me now turn to the Southern Song dynasty, and Chen Fu's *Nongshu* of 1149, the first *nongshu* to describe the technically sophisticated and highly intensive rice and sericulture farming system of Jiangnan. Since Han times, northern Chinese had referred enviously to the southern regions as 'lands of fish and rice' (*yumi zhi xiang* 魚米之鄉), lands of natural bounty where it seemed that food could be grown and gathered without effort. In fact, various advanced agricultural techniques, including large- and small-scale irrigation methods and rice transplanting, were evident in parts of southern China well before the Song dynasty, and as early as the mid-Tang the amount of tax grain recorded for the southern provinces nearly equalled that from the northern heartlands.⁴⁷ It was not until the fall of the Northern Song, however, that the ruling elite finally acknowledged the south as being more than just a place of exile in which to wait until returning to the true cultural heartlands,⁴⁸ but also as a land that embodied the spirit and potential of true Chinese identity. Although many *nongshu* were produced in the six centuries after the *Qimin yaoshu* was completed, the first great works celebrating and explaining Jiangnan's highly productive farming systems did not appear until just after the fall of the north in 1127 and the establishment of a new capital at Lin'an 臨安 (modern Hangzhou, in the heart of the Jiangnan rice and silk region).

Chen Fu's *Nongshu* was completed just twenty years after the loss of the north. It is a short, pithy work, rich in technical detail, and Chen (of whom we know nothing beyond his authorship of this treatise) tells us that one aim of writing it was to refute the 'empty words' of Jia Sixie (who – as a northerner – was not, it is true, a great expert on rice). The work is divided into three *juan*, the first of which describes the technical procedures of rice farming, the second

⁴⁶ Here it is instructive to compare the archaeological evidence (animal bones, figurines, etc.) with the surviving written documents of the period. Xu Wangsheng (2009) shows a significant imbalance: from the Han onwards it seems that written documents significantly under-represented the importance of pigs (and presumably of pork) in every region of China.

⁴⁷ Li Bozhong (1990), 248–67; Bray (2013), chapter 2. ⁴⁸ Dien (1991).

is devoted to *niu* 牛 (which in this case refers to water buffalo), and the third to sericulture. Chen depicts a landscape of small farms co-produced, as the STS (Science and Technology Studies) scholars would say, by men, buffalo and silkworms:

On high land identify the places where water accumulates and dig out ponds. Out of 10 *mu* of land [approx. 0.6 ha] you must be prepared to set aside 2 or 3 *mu* for water storage. At the end of the spring when the rainy season comes, heighten the banks and deepen and widen the interior. Strengthen the banks by planting mulberry or *zhe* 柘 trees,⁴⁹ to which buffalo may be tethered in the shade as their nature requires. By trampling the banks the buffalo will strengthen them, the mulberries will be well watered and grow into fine trees, and even in the dry season there will be sufficient water for irrigation, yet in heavy rains the tank will not overflow and harm the crops.⁵⁰

Introducing the second *juan* of his treatise, Chen Fu attacks what he sees as the elite's unjustified idolization of horses at the expense of the truly useful animal, the water buffalo, on whose labours society and human survival depend:

Some ask: which makes the greater contribution to society, the horse or the buffalo (*niu*)? Which is the faster? Which is the more important? Why is it that the horse is so highly valued, and the buffalo despised?

I would reply: both help humans in their endeavours. But if horses are considered several times, or even a hundred or a thousand times more valuable than buffalo, it is because men of high rank ride them, the imperial armies use them, they are given fine grains as feed, they are carefully trained and meticulously bred. They are used by nobles and there are a whole series of official positions dedicated to horses. This is why horses are so highly valued.

As for buffalo, apart from pulling carts, they are used only for farm work. They are let out to graze in the brush, and they are used in the fields. When they are toiling they are sometimes heeded, but when they are idle nobody pays any attention to them. Nobody notices when they are hungry or thirsty, nobody shelters them from heat or cold, nobody treats them when they are sick, nobody pities their distress. Yet farming is the great foundation of our society (*tianxia* 天下), the source of all clothing, food, wealth and utility – and without buffalo none of this could be achieved! Nothing can outweigh this when we assess which is more valuable, the horse or the buffalo.⁵¹

Chen Fu goes on to argue that the educated elite must take on responsibility for persuading the ignorant peasants to treat their draught animals well and to understand and respect their needs. This will slowly result in a change of attitude; the animals will thrive and there will be no danger of arable land reverting to the wild, or of shortages of food or textiles.

⁴⁹ The silkworm thorn, *Cudrania tricuspidata*, a close relative of the mulberry whose leaves are also used to feed silkworms.

⁵⁰ *Nongshu*, 2. ⁵¹ *Nongshu*, 15.

After this moral lesson with its allegorical echoes of good governance, Chen reverts to his persona of a practical, no-nonsense farm manager for a few columns. He provides details of how buffalo should be cared for in the different seasons, when grass should be cut for hay, what mixtures of bran or beans they should be given – raw or as a mash, depending on the weather and the time of day. He reminds us that buffalo should not be put to work on a full stomach, and that they need plenty of rest if they are to work at full strength and to live long and useful lives. But then Chen's discussion once more takes a moral turn: he underlines the physiological similarities between buffalo and humans, arguing that this should help us to understand their physical needs. In the old days, Chen says, people covered their buffalo with a blanket when they were cold, made up specially nourishing feeds to keep them sleek, and set aside part of their fields for pasture, being fully aware that they depended upon their animals for their own welfare. Alas, says Chen, this is no longer so and that is why everything is in such a sorry state.

A brief section on treating buffalo sicknesses follows, which again underlines their similarities with humans. At one level this illustrates the point made by Francine Fèvre and Georges Métaillé that, 'in the Chinese tradition, veterinary medicine hardly differs from human medicine, and so remedies for animals appear in the earliest treatises on human medicine'.⁵² But does this merely signify a belief that physiological principles are shared between animal species, just as in modern biomedicine scientists use rats as near proxies for humans in tests of aggressiveness, or pigs as creatures close enough immunologically to provide transplant organs? Is there also a moral dimension to the parallels proposed between humans and some – but not all – animals?⁵³

Just before Chen Fu completed his treatise, Lou Shu 樓璿 (1090–1164), the magistrate of Yuqian 于潛 county near Lin'an, produced a magnificent set of painted scrolls depicting all the technical stages of rice farming and silk production (the tasks of men and of women, respectively), entitled *Gengzhi tu* 耕織圖 (Pictures of Tilling and Weaving).⁵⁴ Lou Shu inscribed each of his paintings with a poem. The scenes of ploughing, harrowing and rolling the rice-paddies show man and buffalo toiling, suffering and enduring together. The buffalo receives (at least from Lou Shu, if not perhaps always from the farmers themselves) the sympathy and, indeed, the empathy that Chen Fu advocates: 'the black bullock labors, making his shoulder raw⁵⁵ . . . Deep in the mud, the four hooves are heavy, at dusk the two legs are aching. I urge the

⁵² Fèvre and Métaillé (1993), 102, my translation from the French.

⁵³ See Chapter 3 in this volume. ⁵⁴ Bray (2007); Hammers (2011).

⁵⁵ 'Tilling', trans. Hammers (2011), 167. Lou Shu uses a single term, *niu*, which Hammers variously translates as bullock, ox or cow, but in every case a water buffalo of indeterminate sex is shown in the paintings.



Figure 6.3 *Gengzhi tu* ploughing scene. This is a rubbing of the stone carvings commissioned by the Qianlong Emperor in 1769, based on the Yuan dynasty copies of Lou Shu's originals by Cheng Qi. The complete set of rubbings was published in Pelliot (1913).

man behind the ox, carry a whip, but don't use it harshly⁵⁶ ... At dusk [I] accompany the ox, together we bathe in the stream in front of our home.'⁵⁷

At around the time that Chen Fu and Lou Shu were writing, the Chan Buddhist Guo'an Shiyuan 廓庵師遠 (n.d.) produced a guide to enlightenment entitled 'Ten Ox-herding Pictures and Poems' (*Shi niu tu yong* 十牛圖詠). In this work the herdsman hunts for, finds, captures and tames a *niu* (shown in the pictures as a buffalo, though usually translated as ox or bull), rides the animal home to the village, and then forgets first the buffalo and then himself. The buffalo, who stands for one's character or mind, is huge and powerful: the herdsman must use a whip and ropes to capture, subdue and discipline the beast. 'If he does not keep the whip and rope near at hand / the Ox will soon seek out the nearest mud and wallow. / But care for it properly, and it becomes gentle, clean; / it will follow the oxherd willingly, the rope gone slack.'⁵⁸ The Buddhist adept tames his own soul just as the herdsman tames the ox; the Confucian local magistrate is 'the herdsman / shepherd of the people' (*mu min*). In the Confucian order, properly conducted farming, the foundation of society, depends on disciplined human and bovine bodies and minds working in

⁵⁶ 'Harrowing', trans. Hammers (2011), 168. ⁵⁷ 'Levelling', trans. Hammers (2011), 169.

⁵⁸ As translated by the American poet Lewis Hyde (n.d.), 5.

harmony. As Chen Fu and Lou Shu both suggest, when peasants fail to treat their animals with consideration, the problem is at once material, moral and symptomatic of a failure of governance.

Wang Zhen's *Nongshu*: Working the Land in North and South

Another great milestone in the Chinese agronomic tradition was the *Nongshu* by Wang Zhen, completed in 1313. Wang Zhen was an official who had served in various regions of China, in both north and south. Distressed by the devastation wrought by decades of war and disaster that still affected much of China two decades after the Yuan dynasty was established, Wang wrote his treatise hoping to provide a handbook of best practice, culled not only from previous treatises but from his own observations, which would help officials to restore or improve farming in their district. On northern dryland farming methods and crops, Wang quotes extensively from the *Qimin yaoshu*; for the south, Chen Fu is a primary source. Wang's great innovation was to compose an 'Illustrated Register of Farm Implements' ('Nongqi tupu' 農器圖譜), a full inventory of the tools and machinery used in farming and textile production, pairing a technical drawing of each item with an explanation of its construction and use.⁵⁹

Wang Zhen begins his treatise with a brief account of the legendary origins of agriculture, beginning with the divine birth of the Heavenly Husbandman, the first farmer, who had the body of a man and the head of a bull, going on to the origins of ox ploughing and silkworm domestication.⁶⁰ Wang repeatedly insists upon the fundamental importance of the ox or buffalo, *niu*. His illustrated register takes inspiration from Chen Fu, inserting an entry on 'plough oxen' (*geng niu* 耕牛) right between the plough and the harrow, in his initial entry in the section on 'ploughing instruments'.⁶¹ Just as the passage on the plough traces its legendary origins and its moral and economic significance before launching into details of its construction, so the entry on *geng niu* begins with a history of taming *niu* and their uses from antiquity, the start of ox-drawn ploughing in the Spring and Autumn period, and the place of *niu* in annual rituals. It goes on to provide some instructions for their care, but the bulk of that information is provided elsewhere, in the animal husbandry section in the first part of the book, 'General Advice on Agriculture and Sericulture' ('Nongsang tongjue' 農桑通訣).

Following the model of the *Qimin yaoshu*, Wang Zhen's section on animal husbandry (*chu yang* 畜養) contains entries on horses, *niu* (including both northern cattle and oxen and southern water buffalo), sheep, pigs, chickens,

⁵⁹ Bray (2007). ⁶⁰ [Wang Zhen] *Nongshu*, 'Nongsang tongjue' 1, 3–5.

⁶¹ [Wang Zhen] *Nongshu*, 'Nongqi tupu' 2, 202–4. There are two accompanying illustrations, one obviously a water buffalo, the other possibly an ox.

swans and geese, and fish. Wang Zhen has absorbed Chen Fu's message: the entry on equines is only three columns long. Since *niu* are more important for farmers, Wang remarks that there is no need to say more.⁶² The entry on *niu* – much more substantial at over two pages long – is essentially an edited version of Chen Fu's text.⁶³ The eight-column entry on sheep consists largely of quotes from the *Qimin yaoshu*, and concludes by saying that wool and dairy products can be marketed and bring good profits.⁶⁴ Like those on poultry and sheep, the short entry on pigs once again consists essentially of quotes from the *Qimin yaoshu*.⁶⁵

There is not much to be read between the lines of Wang Zhen's husbandry section. Yet, in gauging the relative significance of animals in the rural economy and the moral culture of the time, we should also consider the various entries in the *Nongqi tupu* that describe mules working machinery, reflecting the indispensable role of these strong and hardy animals in the northern provinces, and belying the brevity of Wang Zhen's entry on equines in the husbandry section.⁶⁶ There are also brief, illustrated accounts of how to lay out a farmyard and build a south-facing byre,⁶⁷ as well as an entry on 'the herdboy's flute' (*mudi* 牧笛), depicted as an essential piece of equipment for anybody herding animals.⁶⁸ Wang Zhen's illustration shows a lad riding on a water buffalo's back; boy and beast look serene and content as they move through the empty landscape with the moon overhead, a vision that closely matches 'Riding Home' in the 'Ten Ox-herding Pictures and Poems'.⁶⁹

A Local Treatise: Pork Comes into its Own

Finally, let us consider how livestock feature in a well-known and widely anthologized *nongshu* from the high Qing period, the *Binfeng guangyi* of 1741.⁷⁰ The author, Yang Shen, represented himself in the preface as a modest scholar-farmer who had never moved far from his Shaanxi home, though, in fact, he worked closely with the eminent statesman Chen Hongmou 陳宏謀 (1696–1791) on projects to revive the local economy.

The *Binfeng guangyi* is one of our most important sources for sericultural history; it is also notable for the unusual attention it devotes to livestock.

⁶² [Wang Zhen] *Nongshu*, 'Nongsang tongjue' 5, 58.

⁶³ [Wang Zhen] *Nongshu*, 'Nongsang tongjue' 5, 58–60.

⁶⁴ [Wang Zhen] *Nongshu*, 'Nongsang tongjue' 5, 61.

⁶⁵ [Wang Zhen] *Nongshu*, 'Nongsang tongjue' 5, 61–2.

⁶⁶ Including four different types of grain mill; cf. [Wang Zhen] *Nongshu*, 'Nongqi tupu' 9, 282–4, 286.

⁶⁷ [Wang Zhen] *Nongshu*, 'Nongqi tupu' 12, 317, 319.

⁶⁸ [Wang Zhen] *Nongshu*, 'Nongqi tupu' 7, 262–3. ⁶⁹ Hyde (n.d.), 6.

⁷⁰ Wang Yuhu (1979), 221.

Typically, Yang Shen links technical and moral excellence in his short *nongshu*, ‘valoriz[ing] the small-producer patriarchal household as optimal for reasons both of ritual propriety and economic efficiency’.⁷¹ Yang recognizes that households need a source of cash income and, in addition to sericulture, he proposes market gardening and raising animals for sale.

Yang Shen starts, naturally, with Lord Tao Zhu, but goes on to say that not all five types of livestock do well in his region: he has therefore chosen to discuss only pigs, sheep and goats, and poultry.⁷² Cattle and horses are omitted entirely and though sheep feature in the *Binfeng guangyi* as key livestock that have maintained their traditional importance in the harsh and barren environment of the northwestern loess-lands, pigs precede sheep in Yang’s livestock section, perhaps in response to the proximity of Xi’an and other urban markets. Sheep are a valuable source of wool as well as meat: the local breed can be sheared three times a year (in the third, sixth and eighth months), and should be carefully washed and combed before each shearing. In deciding whether to farm pigs or poultry, sheep or vegetables, a family should consider its labour resources and, above all, whether it can afford to feed and graze livestock. Yang suggests that both sheep and pigs in his region can be put out to graze or forage for much of the year, but pregnant and lactating animals, as well as newly born and unweaned animals, need special feeding, and all of them must be housed in stalls and fed in the winter, so land has to be set aside to grow clover or beans for their fodder.

The *Binfeng guangyi*, like late imperial *materia medica* writings (*bencao* 本草), dietetic manuals and works of gastronomy, insists that good, tasty meat depends upon suitable feed, and devotes close attention to a wide range of food and fodder, both for routine feeding and for fattening animals for sale. By the eighteenth century, pigs raised in Jinhua which were destined to become the famous Jinhua ham, were being fed a diet of fruit and vegetables in summer, and hot dishes of rice or brewing-mash in the winter.⁷³ This was by no means novel: the *Qimin yaoshu* specifies the different kinds of food suitable for suckling lambs, young sheep and piglets, and for young castrated animals being fattened for market. Indeed, on close inspection we find that much of the text on livestock care in the *Binfeng guangyi* is borrowed and adapted from the *Qimin yaoshu*, albeit supplemented and updated in sections like those on feeding pigs.⁷⁴ Yang Shen provides some useful new material at the beginning of each section, listing regional breeds and their characteristics (with a perceptible local bias: he says southern breeds of both pigs and sheep tend to be sour and indigestible, while northern animals have sweet and nourishing flesh), and from his material he condenses a snappy and convenient list of

⁷¹ Rowe (2002), 237. ⁷² *Binfeng guangyi*, 3.21a. ⁷³ Kuo (2013), 181.

⁷⁴ *Binfeng guangyi*, 3.24a–b.

'seven do's and eight don'ts' for pig-farmers.⁷⁵ But, considering how much Yang Shen takes directly from the *Qimin yaoshu* – from how to choose a shepherd to when to let animals out to graze – it is difficult to decide how accurately his text reflects local practice. Was the rural landscape of eighteenth-century Shaanxi still dotted with flocks during the spring and summer months? Were pigs let out to forage, or were they kept penned year-round, as they apparently were in Jinhua?

What is most significant about the livestock sections of *Binfeng guangyi* is probably not the technical advice they contain, but rather the fact that here we have a learned Confucian, one of many who composed a *nongshu* to portray the occupations suitable for a virtuous household, recognizing for the first time the moral and economic value of that humble beast, the common pig.

Concluding Remarks

Depictions of livestock in the *nongshu* are certainly much more than simple reflections of stock-rearing practices of the period. Politics, morality and elite *mœurs* were closely entangled in the composition of such texts. To gauge the significance of what an author decided to talk about, and how, one also has to take into account what was *not* included in the *nongshu*.

The early and quasi-canonical *Qimin yaoshu* was unique in the degree to which it integrated livestock with arable farming. In this, it reflected not just the farming landscape of the period, but also elite attitudes about which animals counted, and why. Hence, horses and sheep figured prominently, while cattle and pigs were dealt with more cursorily. Later works reflect a political vision in which livestock play only a minor role in agriculture, with the exception of the ox or buffalo, which are represented as the moral and physical partner in the farmer's toils. During this time, however, evidence from other sources indicates that pigs and other small livestock were kept in increasing numbers, to meet expanding demand not just from the elite, but also from ordinary urban families. While works composed by officials like Wang Zhen and Lou Shu still gave precedence to bovines, emphasizing the moral symbiosis between farmer and ox and – by extension – between peasant and ruler, in actively promoting the breeding of such humble animals as pigs and sheep as an appropriate activity for respectable families, the *Binfeng guangyi* reminds us that that the Confucian morality which imbued late imperial *nongshu* was by no means incompatible with sensitivity to market forces.

⁷⁵ *Binfeng guangyi*, 3.23b–24a.