Milk as payment for farm labour: the dairy economy of a Swedish estate, 1874–1913*

by Carin Martiin

Abstract

The development of Swedish commercial dairy production in the late nineteenth century should not be regarded as a distinct shift from one kind of production to another, nor did it imply a change from a subsistence to a cash economy. On the basis of an investigation of an estate archive from Krusenberg, this article aims at a more nuanced interpretation of this process. It reveals that production for self-sufficiency continued side-by-side with commercial butter production. The use of milk on the estate increased over time, chiefly through the continued use of milk as a means of payment for farm labour. The strategy on this particular estate illustrates a more general tendency in Swedish agriculture around the turn of the century.

The dairy sector in Sweden expanded enormously during the second half of the nineteenth century. Production of butter increased dramatically and butter exports, chiefly to Britain, became of great economic importance. In the mid-1890s, they represented as much as ten per cent of the total Swedish exports by value. At the same time domestic urban demand for dairy products increased and contributed to an expanding market for milk, butter and cheese.

Increasing market demand offered new opportunities for the livestock and dairy industry, which had previously been characterized by a subsistence orientation. Milk and milk products had fulfilled various social purposes within traditional Swedish rural society: milk served as poor relief, cheese was made collaboratively by the women in the parish, and beautifully ornamented butter was displayed at weddings and funerals. Small-scale farmhouse cheese- and butter-making for commercial purposes did exist in Sweden, but it did not play as important a role in the farming economy as it did in England.[1] In traditional Swedish livestock and dairy production, cows and milk were regarded as a part of the female sphere. With the new commercial importance of dairy production, a new status was brought into the dairy sector and this awakened male interest.

Official statistics show large increases in the number of cows, milk yield per head, total milk

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[1] A similar observation is described in Lena Sommestad, 'Från mejerska till mejerist. En studie av mejeriyrkets maskuliniseringsprocess' ['From dairy maid to dairyman. A study of the process of masculinisation in professional dairying'], Ph.D thesis, University of Uppsala, 1992, p. 47, n. 8.

production, number of dairy plants and volume of milk produced during the latter decades of the nineteenth century and first decades of the twentieth.[2] These improvements have given the impression of a rapid and far-reaching switch from a subsistence, household-orientated economy into commercial dairying. In this article I propose a more nuanced interpretation of the change. Without questioning its scale, it is argued that the shift was incomplete and characterized by a combination of self-sufficiency and commercial dairying. The argument is based on a detailed investigation of archive material from a Swedish estate, Krusenberg, for the years 1874–1913.[3] By the end of this period, commercial dairy production was well established at Krusenberg but it had not led to the abandonment of the subsistence dairy economy. On the contrary, the archive reveals that increased commercial milk production was accompanied by a rise in the use of milk and milk products as payments in kind.

Although the study is based on Swedish materials, it may also be found interesting from an international perspective. It is likely that butter from Krusenberg found its way into the export trade to England and consequently affected the British dairy market. The situation here has been tellingly described by Joan Thirsk: 'a new phase opened after 1874, when the farmers who knew all the hazards implicit in war, bad weather and restrictive tariffs, faced another enemy – not unknown before but now suddenly grown giant-like in strength and stature – foreign competition'.[4]

Previous research in English concerning milk and dairy production during the late nineteenth and early twentieth centuries has discussed the motives for commercialization, the timescale over which the commercialization of dairy products took place and the consequences of an enlarged male interest in an exclusively female sphere.[5] Attention has also been paid to the shift from commercial small-scale farmhouse cheese and butter production to deliveries of commercial liquid milk.[6] Previous accounts of the restructuring of dairying have however not

[2] For the number of cattle, see BISOS, Official Swedish Statistics, Arable Farming and Animal Husbandry. For milk yeilds, Carin Israelsson (now Martiin), 'Kor och människor. Nötkreatursskötsel och besättningsstorlekar på torp och herrgårdar, 1850–1914' ['Dairy cattle and people: Cattle husbandry and herd sizes at cottages and estates, 1850–1914'], Ph.D thesis, Swedish University of Agricultural Sciences, Uppsala, 2005, p. 61f. For the number of dairy plants and volumes of milk delivered to them, Gustaf Liljhagen, *Svensk mejeridrifts-statistik för andelsmejerier* [*Swedish* [*Dairy statistics, co-operative dairies*] (published annually 1905–12) and official Swedish statistics, Dairy Statistics, 1913–39. Relatively complete Swedish agricultural statistics were collected from 1865. From this year onwards, the number of cows is relatively well established but figures for commercial dairy production are patchy until 1913.

[3] With regard to dairy production, the Krusenberg archive is the most comprehensive and complete of all the farm archives at the Regional Archive in Uppsala. The Krusenberg archive was also studied for my doctoral thesis, 'Kor och människor'. The document chiefly used here, the dairy journal, D4A:6, will simply be referred to as 'dairy journal'.

[4] Joan Thirsk, *English peasant farming. The agrarian history of Lincolnshire from Tudor to recent times* (1957), p. 198.

[5] See Joanna Bourke, 'Dairywomen and affectionate wives: women in the Irish dairy industry, 1890–1914', *AgHR* 38 (1990), pp. 149–64; T. W. Fletcher, 'Lancashire livestock farming during the Great Depression', *AgHR* 9 (1961), pp. 17–42; C. Hallas, 'Supply responsiveness in dairy farming: some regional considerations', *AgHR* 39 (1991), pp. 1–16; Bodil K. Hansen, 'Rural women in late nineteenth-century Denmark', *J. Peasant Studies*, 9 (1982), pp. 225–40; Sally McMurry, 'Women's work in agriculture: divergent trends in England and America, 1800 to 1930', *Comparative Studies in Society and History* 34 (1992), pp. 248–70; Lena Sommestad, 'Able dairymaids and proficient dairymen: education and de-feminization in the Swedish dairy industry', *Gender and History* 4 (1992), pp. 34–48; Sally McMurry and Lena Sommestad, 'Farm daughters and industrialization: a comparative analysis of dairying in New York and Sweden,

discussed the survival of a subsistence dairying economy alongside the nascent commercial economy, which is what we find at Krusenberg and, it is suggested, in Sweden generally.

I

The archive from Krusenberg offers material for a comprehensive study of an estate with mixed agricultural production. In common with other large farms at this time, Krusenberg was characterized by increased concentration on dairy and feed production. Some commercial horticultural production was also undertaken.

The estate was well located, with good sea connections and, from 1866, railway communications to Stockholm and Uppsala, respectively 60 kilometres south and 15 kilometres north-west of the estate. Figure 1 illustrates Krusenberg with its arable land, forests and numerous poor settlements. The total estate area covered as much as a third of the small rural parish of Alsike, characterized by a mosaic of arable land, small pastures, exposed rock and extensive pine forests. Despite its dominant position in the parish, Krusenberg may be regarded as a middle-sized estate, with 300 hectares of arable land, 20 hectares of pasture, seven hectares of garden and 600 hectares of forest. In 1896 about three quarters of the arable land was used for feed production: hay, oats, barley, leguminous plants, potatoes and roots. No information has been found about earlier cultivation, but Krusenberg almost certainly followed the general Swedish trend of increasing the production of fodder-crops for cattle in the latter half of the nineteenth century. Animal production was dominated by the dairy herd, but horses, oxen, bulls, sheep, pigs and poultry were also found on the estate.[7]

Krusenberg had two proprietors during the period under discussion. Carl Cederström died in 1892, but the responsibility for the management of the estate was transferred to his son, Emanuel Cederström, in 1890. At first sight, the most important innovations in dairy production appear to have been introduced by the older man who invested in a dairy and a cowshed during the 1870s. A closer study reveals that further changes were implemented by Emanuel Cederström in the early 1890s.

Note 6 *continued*
1860–1920', *J. Women's History* 10 (1998), pp. 137–64; Kirsti Niskanen, 'Modernisation revisited: market structures and competent farmers in Södermanland county, Sweden, during the late nineteenth and early twentieth centuries', *Rural Hist*. 8 (1997), pp. 175–93; D. Taylor, 'Growth and structural change in the English dairy industry, *c*.1860–1930', *AgHR* 35 (1987), pp. 47–64; id., 'The English dairy industry, 1860–1930: the need for a reassessment' *AgHR* 22 (1974), pp. 153–59; N. Verdon, 'Women and the dairy industry in England, *c*.1800–1939' (paper presented at the XIVth International Economic History Congress in Helsinki, Aug. 2006); E. Whetham, 'Supply responsiveness in dairy farming: a note', *AgHR* 39 (1991), pp. 169–70; and M. Winstanley, 'Industrialization and the small farm: family and household economy in nineteenth-century Lancashire', *Past and Present* 152 (1996), pp. 157–95.

[6] See Hallas, 'Supply responsiveness', Taylor, 'English dairy industry' and id., 'Growth and structural change', Verdon, 'Women and the dairy industry' and Whetham, 'Supply responsiveness'.

[7] Regional Archive, Uppsala, Primary statistics, F4A:14, including all crofts and two smaller farms. Statistics were collected by The Agricultural Society of Stockholm County as a primary source for the official Swedish statistics. Exact proportions between crops for human and animal use cannot be stated because some crops may have been used for both human and animal purposes.

FIGURE 1. Map illustrating the area of the Krusenberg estate. The manor house, farm buildings and some workers dwellings are found down to the left. Crofts are scattered over a wide area. White indicates arable land, including meadows, and grey wooded land.

Illustration: Karin Hallgren, Agricultural and Rural History, Swedish University of Agricultural Sciences.
Sources: The map has been constructed with the help of several maps: The Research Archive at the Swedish Board of National Land Survey, A3–2:3 1894, Gävle; a privately owned map of Krusenberg, 1841–43; a map of Alsike parish 1895 and mapping of the hundred Ärlinghundra with Alsike parish, 1895, DVD, The Swedish Board of National Land Survey, 2003.

According to an estate inventory of 1892 made after the death of Carl Cederström, farming was the main source of income for the family, although Cederström also owned other rural property and a flat in the very centre of Stockholm. The city and country households were closely connected. The proprietor's family moved between the two, goods were transported

FIGURE 2. Krusenberg manor house. *Photo*, Carin Martiin, 2008.

from one to another and the staff were occasionally transferred from the one household to the other.[8] The aristocratic character of the family is illustrated by Emanuel Cederström's membership of the county agricultural society.[9] Membership may indicate an interest in progressive agriculture, but a close study of the Krusenberg estate archive reveals that neither agriculture nor dairying at Krusenberg were outstanding.[10] As well as the Cederström family at the manor house (Figure 2), a large number of other people lived on the estate, some of them close to the manor house or the home farm, but many at crofts and other scattered settlements. These inhabitants and the estate labour force are described later.

II

Dairy production at Krusenberg can be followed from the 1860s, although sources are patchy until November 1873 after which the archive provides excellent opportunities for studying the dairy economy. The commercial importance of dairy production started to grow in the mid-1860s. During this decade cash income from the dairy rose from seven to 20 per cent of total farm income, although grain remainded the most important source of income at this time.[11]

In the early 1870s, a new dairy was brought into use. At the end of the decade the dairy cattle

[8] Regional Archive, Uppsala, Krusenberg archive, F3:1 (estate inventory, 1892).

[9] *Uppsala läns hushållningssällskaps handlingar, 1879–81* [*Uppsala County Agricultural Society, 1879–81*], p. 153.

[10] Among other observations, many cows had long dry periods and the milk/butter ratio was relatively low. Regional Archives, Uppsala, Krusenberg archive, D4:2 (stable journal) and dairy journal.

[11] Regional Archives, Uppsala, Krusenberg archive, cash journal, G2A:2. The book-keeping year was Nov.-Oct. In this article the period Nov. 1873-Oct. 1874 is treated as 1874 and so on.

FIGURE 3. Farm buildings at Krusenberg including the old cowshed (white walls) where diary production took place from the 1870s to the late twentieth century. *Photo*: Carin Martiin, 2008.

were moved into a large new building (Figure 3). From then on, commercial dairy production at Krusenberg was well established. The number of milch cows increased from about 30 in the 1860s to more than 80 in the 1890s. It took about fifteen years for the herd size to reach its maximum and for the cowshed to be fully utilized; a result of increased breeding of heifers after Emanuel Cederström inherited the estate.[12]

From 1874 to 1913 milk production increased 270 per cent, peaking in 1909, when 155 tons were produced. From around 1910 the trend was reversed, with a decrease in the number of dairy cows, reduced volumes of milk produced and declining dairy income. This downturn is specific to Krusenberg and does not mirror any general tendency in the market. No clear explanation for these changes has been found other than possibly a reduced interest in the dairy business by the Cederström family. So whilst production peaked in 1909, the following years were marked by a ten-fold increase in the sale of cream, probably to another dairy, and at the end of 1913 the estate dairy seems to have been shut down. By analogy with changes elsewhere, the processing of milk from Krusenberg may then have been transferred from the private estate dairy to a co-operative dairy factory.[13]

[12] Regional Archive Uppsala, Krusenberg archive, D4:1, D4:2 (stable journals). The number of dairy cows varied slightly from year to year. The size of the cowshed has been estimated with the help of a map (Krusenberg farm archive) and personal inspection of the building, which was used for dairy cattle until the late twentieth century.

[13] Regional Archive Uppsala, Krusenberg archive, D2:1 (inventory) and Official dairy statistics, 1913–39. The transition from private to co-operative dairy plants has been discussed by Kirsti Niskanen, 'Godsägare, småbrukare och jordbrukets modernisering Södermanlands län, 1875–1935' ['Large farmers, small farmers and the modernisation of agriculture, Södermanland county, 1875–1935'], Ph.D thesis, University of Stockholm, 1995, p. 41.

A detailed dairy journal was kept throughout the period of commercial dairying at Krusenberg, from 1874 to 1913, and this forms the chief source for this paper. It records the quantities of milk produced and delivered to the dairy, and the ways in which it was utilized. An audit of the source confirms its essential reliability. Almost all milk was transported from the cowshed to the dairy, weighted in and registered, irrespective of whether the products were intended for sale or for internal use. No noticeable volumes seem to have been received from other herds.[14]

III

Milk is a flexible product which can be processed into a number of value-added products. This can be quickly rehearsed with reference to dairying at Krusenberg.

Except for milk intended to be consumed fresh, all milk at Krusenberg was processed into cream and skimmed milk. (No cheese production was noticed in the dairy journal after the first few years.[15]) The five products which were handled at the dairy are as follows and the relations between them are illustrated in Figure 4.

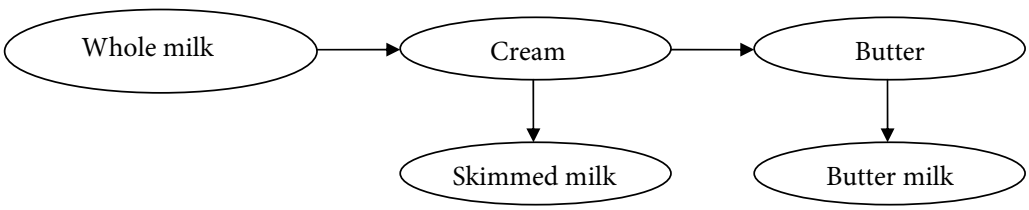

FIGURE 4. Milk products produced at Krusenberg.

1. *Whole milk*. The most valuable form of milk and the basis of all the others.
2. *Cream* should be regarded as an intermediate form, made in the process of turning whole milk to butter, and only small quantities of fresh cream were sold or consumed in the estate household.
3. *Butter* was the most valuable and tradable of the products made on the estate.
4. *Skimmed milk* was an important by-product of the creaming process where the cream was skimmed from the milk.
5. *Buttermilk* was a by-product of churning of cream into butter.

All the products in Figure 4 were sold but, as will be discussed later, all also had roles within the estate economy (Table 2).

[14] Regional Archive Uppsala, Krusenberg archive, D4:1, D4:2 (stable journals) and dairy journal. The farm at Kungshamn was also owned by the Cederström family but had a separate dairy (F3:1, estate inventory). Obviously Krusenberg had a so-called estate dairy, processing milk only from the estate. This was one of four main categories of dairies in Sweden: the others estate dairies which also processed milk from other farms; dairies owned by private companies; and cooperative dairies (Official dairy statistics, 1913–39, and Niskanen, 'Godsägare, småbrukare …', pp. 38ff).

[15] The dairy journal has a few early references to cheese production, but thereafter no cheese at all was recorded. Receipts from purchase of cheese from Uppsala confirms that cheese was not produced on the estate (F3:1, estate inventory).

Dairying can be regarded as a closed system where milk is separated into different products without anything being added or taken away (except, in butter-making, salt and, eventually, colour). This means that the total weight of the five products equals with weight of the initial whole milk. Figures 5 to 10 are all based on the weight of butter, skimmed milk etc. produced and recorded in the dairy journal. This is one of several methods which can be used to analyse the production and use of dairy products but it conceals the differing value of the products, for example between one kilo of butter and one of skimmed milk.

The separation of whole milk into dairy products of varying economic values, durability and potential usefulness implies that the attention given to each reflected management decisions of great importance. Yet, the efficiency with which butterfat was extracted from milk did not receive much attention from successive owners of Krusenberg. During the years 1874–1913, the ratio of milk and butter varied more than 25 per cent from year to year. In kilos, it varied between 25.2 and 37.6 kilos, with an average of 31.3 kilos of milk to produce one kilo of butter. A sudden improvement occurred in the early 1890s, but then again the ratio increased and was relatively high even in the 1910s.[16] Comparisons with the general Swedish milk:butter ratio must be restricted to the period 1905–10 when the first official figures, which only covered about half of Swedish dairies, were collected. These figures present an average of 26.0 kilos of milk to one kilo of butter, about ten per cent better than the average of 28.3 at Krusenberg between 1905 and 1910. On this measure Krusenberg should not be regarded as a model of efficient butter production in the early years of the century.[17]

A low level of technology at the dairy stands out as a possible reason for the low level of butter production achieved at Krusenberg. According to the estate inventory from 1892, the dairy technology was based on manual creaming and hand-driven butter kernels, which were then old-fashioned, a decade after the introduction of the DeLaval separator. In April 1895 a dairy adviser, Gustav Bohm, visited the estate dairy and pointed out three technological problems: too much cream was poured into each churn, intervals between the churnings were too long, and the indoor temperature was too low in wintertime. Bohm suggested some new investment, but did not go so far as to recommend the purchase of a separator, which would have been appropriate by this time. As far as may be seen from the milk:butter ratio, Bohm's advice did not result in any tangible improvements.[18] It may also be suggested that out-moded technology and low levels of butter production were linked to the employment of women. Lena Sommestad has demonstrated that the adoption of modern technology resulted in a redefinition of the gendered division of labour in Swedish dairying.[19] Such a process though only really applies to the larger dairy plants in the decades *after* the period studied in this article and is probably not relevant to a small estate farm at this date.

The poor average milk:butter ratio and its yearly fluctuations may also be explained by a lack of ambition in dairy production. This is indicated by the fact that the dairy maids stayed

[16] Dairy journal.

[17] Liljhagen, *Svensk mejeridrifts-statistik* …, based on reports from cooperative dairies in about half of all Swedish counties; Dairy journal.

[18] Regional Archive Uppsala, Krusenberg archive, F3:1 (estate inventory); Sommestad, 'Från mejerska till mejerist', p. 48; D4:2 (stable journal).

[19] Lena Sommestad, 'Rethinking gender and work: rural women in the Western world', *Gender and History* 7 (1995), pp. 100–05, *passim*.

only 2.4 years on average.[20] Employment for two or three years is not surprising for young unmarried women doing unskilled work, but not when it comes to skilled and responsible tasks in an estate dairy. Moreover, the dairy maids were badly paid, at a level between the estates' house-maids and laundry women. Such a level would probably not have been acceptable to experienced and skilled dairy maids and suggests that the butter production was run by young, unqualified, unmarried women.[21] A consequence of this approach to dairying may have been the creation of a vicious circle of unattractive working conditions and dissatisfied dairy maids who lacked the competence, pride and influence that ambitious and experienced dairymaids brought to the task. The importance of these qualities has been stressed by Sally McMurry and Lena Sommestad. They are also emphasized in the answers to a questionnaire concerning the working conditions of contract workers distributed in 1938. We can speculate that poor working conditions, low wages and a rapid turnover of staff hindered the achievement of quality production at Krusenberg.[22]

In essence, the farm management seems to have been unaware of the importance of good dairy maids. Although the poor milk:butter ratio did not mean that valuable butterfat disappeared totally, it resulted in an uneconomic distribution of butterfat. The quantity of butter produced was reduced, while the skimmed milk retained a higher fat content that was probably not compensated for by a higher price when sold or through a corresponding increase in the production of veal or pork when it was used as feed.

IV

The importance of varying kinds of milk products may be measured in market values, quantities (kilos of butter, of skimmed milk etc) or with regard to usefulness (whole milk versus buttermilk etc). Figure 5 demonstrates the quantitative and economic distribution between the varying marketed dairy products from Krusenberg from 1874 to 1913. Butter, valuable and concentrated, was the most important source of income from dairying, contributing 69 per cent of the total income but only five per cent of the quantity by weight. On the other hand, the voluminous skimmed milk represented 89 per cent of the weight but only 26 per cent of income. Sales of fresh milk, of cream for direct consumption, and of buttermilk from the churning process, were all of marginal importance, contributing in all six per cent of the quantity and five per cent of the cash income from the dairy.

Figure 5 shows only marketed dairy products and not the quantities used on the farm. Notwithstanding a doubling of total marketed quantities from 1874 to 1909 (when commercial production reached its maximum), vast quantities continued to be used to pay workers in kind. Figure 6 clearly illustrates how the total quantity of dairy products used within the estate also increased over time despite the establishment of commercial butter production.

[20] Regional Archive Uppsala, Krusenberg archive, G4A:6 (monthly reports from the dairy, 1880–1906, including names of dairy maids).

[21] Regional Archive Uppsala, Krusenberg archive, F3:1 (estate inventory).

[22] McMurry, 'Women's work in agriculture', pp. 251f.; Lena Sommestad, 'Able dairymaids and proficient dairymen; education and defeminization in the Swedish dairy industry', *Gender and History* 4 (1992), pp. 34–48 and questionnaire NM 82 from the Nordic Museum, Stockholm, *Statare* [contract workers].

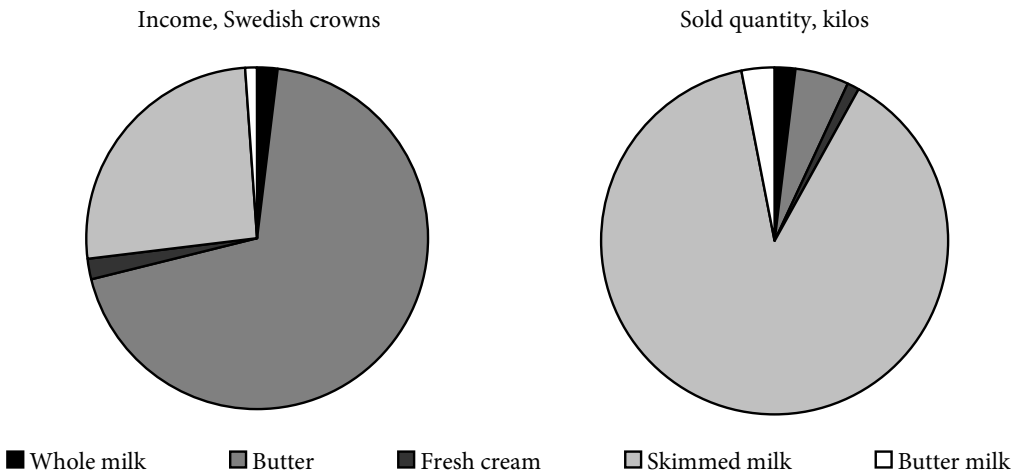

FIGURE 5. Proportional distribution of marketed quantities of whole milk, butter, fresh cream, skimmed milk and buttermilk from Krusenberg, 1874–1913, by value and weight.

Source: Calculated from dairy journal.

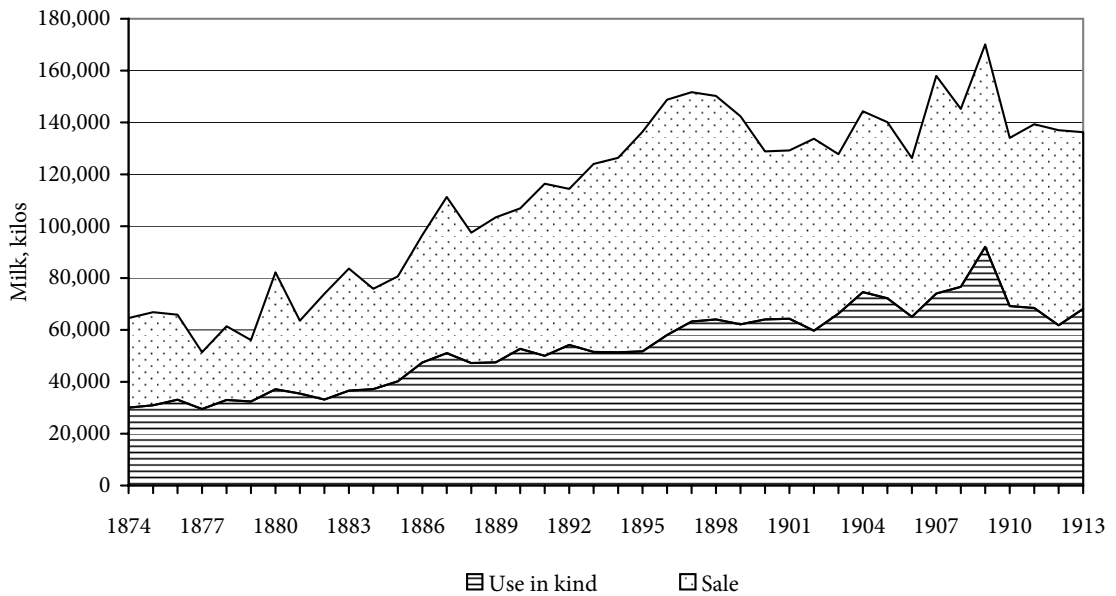

FIGURE 6. Quantities of milk and milk products sold and used to pay workers at Krusenberg, 1874–1913 (kilos). Note that the figure is the result of the addition of products with strongly varying concentration and value: whole milk consumed fresh, butter, cream consumed fresh, skimmed milk and buttermilk.

Source: Calculated from dairy journal.

TABLE 1. Distribution between quantities sold at the market or used to pay workers at Krusenberg, 1874–1913 (per cent)

	Whole milk	*Butter*	*Fresh cream*	*Skimmed milk*	*Buttermilk*
Sale	7	96	50	66	14
Payments in kind	93	4	50	34	86
Total	100	100	100	100	100

Source: Dairy journal.

According to Figure 6, only about half of the total production by weight was sold while the remainder was used internally. Moreover, the volumes used for payment in kind increased in parallel with the commercial production, both doubling between 1874 and 1913. The figure also shows how the proportion for internal use was somewhat more stable when compared with quantity marketed, varying 15–20 per cent from one year to another. Obviously, an increased production for commercial purposes did not mean that the use of milk as payment was abandoned at Krusenberg. It should, however, be remembered that the method of describing milk products by weight conceals their differing values and characters. When value is taken into consideration, the proportions sold and used for payment are found to be quite different. Of all whole milk, 85 per cent was sold as butter, fresh whole milk or fresh cream, whilst only 15 per cent was used to pay workers.

A more detailed view of the distribution between sale and payments in kind is presented in Table 1. Almost all butter and two thirds of the skimmed milk were sold, while the larger part of the less valuable buttermilk was used on the farm. The small quantities of fresh milk sold probably refer to the occasional sale of small quantities to individual customers. The proportions of fresh cream are somewhat misleading and are explained by a heavy increase in sale of cream after 1910, whilst in previous years the only fresh cream used on the estate was that consumed at the Cederströms' table.

V

We now turn to a fuller investigation of the use of dairy products within the estate. A large and varied population inhabited the estate and its surroundings: the Cederström family itself, their housekeepers, gardeners, farm managers of varying levels, horse drivers, craftsmen, dairymaids, agricultural workers, and the members of their families. Moreover, about thirty crofts and other poor settlements were scattered around the estate.[23] Crofters and craftsmen-crofters made a living out of varying combinations of daywork on the estate, the cultivation of small plots of arable land and small-scale livestock production with one or two cows. The poorest inhabitants, widows and others, had little or no land but often had a cow. Seen from the vantage point of the estate, the inhabitants can be divided into four categories.

[23] Regional Archive Uppsala, Parish catechetical lists, Alsike parish, AI:11–14 and AIIa:1 (1871–1900). The crofts are further discussed in Israelsson, 'Kor och människor', pp. 82ff. and p. 286.

1. The Cederström family and their guests.
2. Their employees who took their meals in the estate household, in or close to the kitchen. Characteristically, these were young, single women and farmhands, working in- or outdoors, but they included some older, unmarried persons.
3. Contract workers to whom milk was given as a form of payment in kind.[24] These families were provided with a simple place to live, often a room with a shared kitchen. Their contract also gave then clothes and food such as rye meal, potatoes and herring. The contract workers were usually married. The men in this category worked in arable farming, or the stables: they undertook repairs on the estate, and cut firewood and ice in wintertime. In general, the women did the milking two or three times a day.[25]
4. There were then crofters and others with one or two cows of their own. Several crofts are shown in Figure 1. Whilst the croft would include a small garden plot and a byre, crofters, or people substituting for them, had to do two or three days work for the estate each week as rent for the croft. Occasionally the crofter family bought feed or calves from the estate, and sometimes cattle were sold from the croft to the estate.[26]

Whilst the last group produced their own milk, the consumption of the first three categories was noticed in the estate's dairy journal. This also shows that milk was used as feed for a wide range of animals on the estate.

The system of employing contract workers, *statare* in Swedish, was well known in the country, and has often been seen to represent miserable conditions and the exploitation of rural people. *Statare* was practised at large or middle sized farms and characterized by annual contracts and payment in kind: grain, milk, potatoes, wool, housing etc, supplemented with a little cash each year.[27] Contract workers were usually married and their wives were normally obliged to do the daily milking. The position of the wives has sometimes been described as close to slavery. The food payments were often fixed within a farm, irrespective of the size of a worker's household, although large families might have some extra ration provided. The number of contract workers increased during the nineteenth century, which Mats Morell has related to the growth of Swedish dairy production.[28] As this expansion was export-driven in its early stages, there are close connections between the increased employment of contract workers and the commercialization of dairying for export.[29]

[24] The term 'contract workers' is also used by Christian Lundh and Mats Olsson, 'Contract workers in Swedish agriculture in the nineteenth and twentieth centuries' (paper presented at the Twentieth International Congress for Historical Sciences, Sydney, 2005).

[25] The description is based on The Nordic Museum, Stockholm, questionnaire NM 82, *Statare*. Sources for female work at Krusenberg are inadequate and do not describe work done by contract workers' wives.

[26] Krusenberg archive, G3B1, account books concerning crofters.

[27] Although use of farm products as payment in kind has strongly been connected with the contract workers, the practice was also used for better off employees, who might get rations of food, housing etc, complemented with more cash than was given to contract workers. See Nordic Museum Stockholm, NM 82, Contract workers, EU 13477, 18727, 29415, 30928, 31856 and 54318, examples from varying parts of south and central Sweden. Dairy journal, separate book with daily notes on volumes distributed to contract workers.

[28] Mats Morell, *Det svenska jordbrukets historia*, IV, *av Jordbruket i industrisamhället, 1870–1945* [*The history of Swedish agriculture*, IV, *Agriculture in the industrial society, 1870–1945*], p. 71.

[29] Nordic Museum, NM 82, Contract workers, and Lundh and Olsson, 'Contract workers', pp. 10f. For an economic perspective on the system, Herman Juhlin-Dannfelt

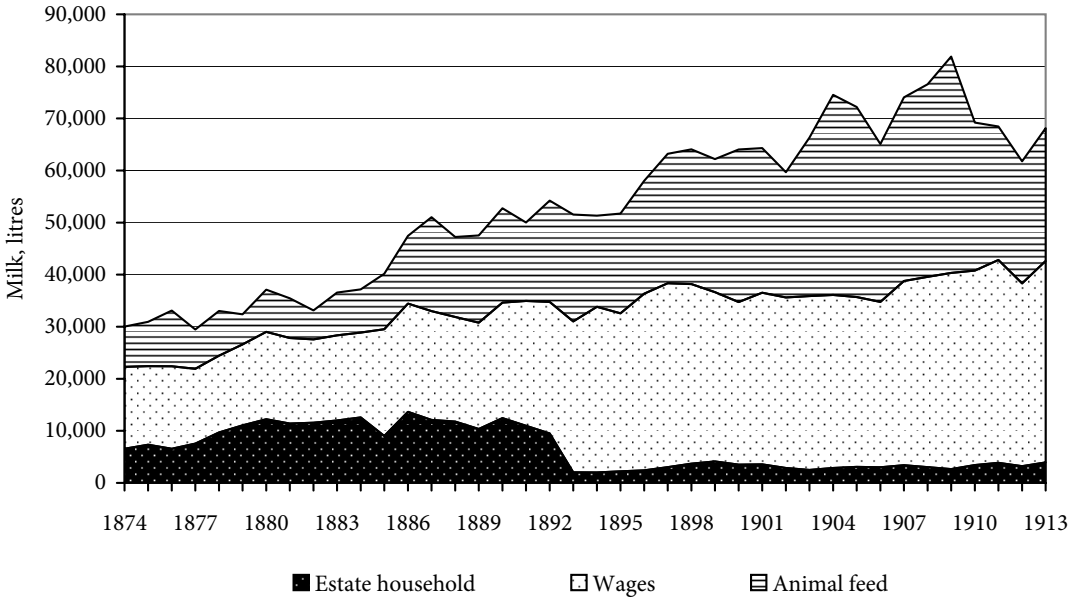

FIGURE 7. Balance of milk and milk products (in kilos) used in the estate household, as wages or as feed, Krusenberg, 1874–1913.

Source: Calculated from dairy journal.

Figure 7 shows the total quantities of whole milk, butter, cream, skimmed milk and buttermilk used in the estate household, chiefly as payment for farm labour or as animal feed. It reveals a continuous increase in the total quantity used for wages and animal feed, whilst the quantities used in the household were drastically reduced from the time of the change of ownership in the early 1890s. The varying kinds of dairy products that were consumed in the estate household, as wages in kind and as feed, are presented in Table 2. This shows how each kind of dairy product was deployed within the estate. Butter and cream were used exclusively by the estate household, whereas, to greater or lesser extent, fresh and skimmed milk were consumed by all categories of humans and animals.

The use of whole milk deserves particular attention. As a multi-purpose commodity that can be used for all kinds of consumption and processed further, the allocation of whole milk to an activity may be regarded as indicating the priority and status attached to it. Between 1874 and 1913, 85 per cent of the total volume of whole milk was utilized for commercial butter

Note 29 *continued*
and Abraham Sjöström, *Handbok i jordbruksekonomi* [*Agricultural Economics*] (1906), p. 418. The Swedish term *statare* refers to the word *stat*, 'allowance in kind'. Swedish contract workers are described in Sven Jerstedt, *På statarnas tid* (1975) and Lars Olsson (ed.), *Skånska statare och lantatbrtare berättar* (1985), publications based on contemporary accounts. The miserable living conditions among contract workers were frequently described in fiction during the 1930s and '40s, for instance, Ivar Lo-Johansson, *Bara en mor* (1939, trans. *Only a mother*, 1991). and Moa Martinson, *Mor gifter sig* (1936, trans. *My mother gets married*, 1988). For other recent research on contract workers, see Lundh and Olsson, 'Contract workers'.

TABLE 2. Distribution of the varying kinds of milk products at Krusenberg, 1874–1913

	Fresh milk	*Butter*	*Cream*	*Skimmed milk*	*Buttermilk*
Estate household	Yes	Yes	Yes	Yes	Yes
Wages in kind	Yes	Yes[a]	–	Yes	–
Calves	Yes	–	–	Yes	–
Pigs	Yes	–	–	Yes	Yes
Hens	Yes	–	–	Yes[b]	Yes
Horses, foals	Yes[c]	–	–	Yes[d]	Yes
Dogs	Yes	–	–	Yes[e]	Yes
Sheep	Yes	–	–	Yes[f]	–
'Gratifications'	–	–	–	Yes[g]	–

Notes:
[a] Butter was only provided to the agricultural workers between 1892 and 1910, during which between 7 and 24 kilos per year was distributed amongst them.
[b] The poultry at the estate were fed with skimmed milk or little buttermilk during the second half of the period.
[c] In 1892, a foal was fed with fresh milk, skimmed milk and buttermilk.
[d] Refers to skimmed milk given to 'Syra', who may have been a horse.
[e] From 1891, milk was fed to dogs, a new strategy which can be related to the new proprietor.
[f] In 1898, small quantities of skimmed milk were given to the sheep.
[g] From 1891, skimmed milk was distributed as 'gratification'. The dairy journal does not provide further details, but the milk might have been given to retired agricultural workers, their widows etc.
Source: Dairy journal.

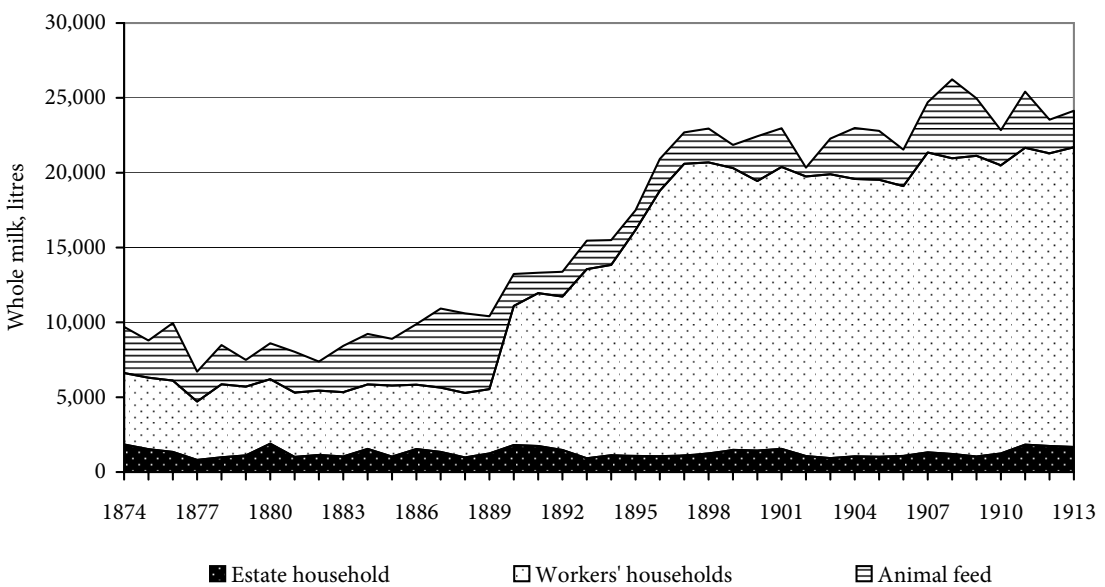

FIGURE 8. Use of whole milk for varying purposes at Krusenberg, 1874–1913.

Source: Calculated from dairy journal.

production and 15 per cent was used in kind at the estate. Of the amount used internally, 75 per cent was used as payment for farm labour, 8 per cent was consumed by the estate household, 15 per cent was given to calves and small amounts to other animals. The large-scale use of whole milk as a payment for work stands out very clearly.

According to Figure 8, where the estate household consumed a constant volume of whole milk over the four decades, the amount of whole milk allocated to the workers' households increased heavily during the 1890s. At the same time, use of whole milk as feed for calves was radically reduced. It has not been possible to investigate whether this was a conscious redistribution within the internal dairy economy, or if there were other reasons for altering the feeding regime for the calves.

VI

The estate household included the proprietor, his family and their guests but also domestic servants and farm hands. As well as provisioning the house at Krusenberg, some dairy products and other foodstuffs appear to have been transported to the family's household in the centre of Stockholm. The consumption of whole milk in the household was relatively stable, about 3.5 litres per day. The consumption of cream and butter changed over time but was, on average, one litre of cream and two kilos of butter per day, probably first and foremost for the proprietor's table.[30]

Use of butter and cream increased progressively from 1874 to 1892. After Emanuel Cederstrom took over from his father, the consumption of the less valuable milk products was drastically reduced, skimmed milk by about 90 per cent and buttermilk almost completely. The consumption of cream was also reduced whilst that of whole milk and butter remained at a stable level. All this suggests a new dietary regime in the estate household was introduced with the change of generations, especially for the labourers whose meals came from the estate.[31]

The fact that maids and farmhands had their meals at the estate, at least until 1892, implies that some of the dairy products that were consumed in the estate household should be regarded as payment for labour, similar to payments to contract workers. It has not been possible to identify the distribution of dairy products within the estate household. What was drunk or eaten by the Cederströms cannot be distinguished from the consumption by the servants in the kitchen. Our lack of knowledge about workers' dairy consumption in the estate household means that exact use of milk as payment for farm labour cannot be calculated. Since workers' consumption within the estate household was low compared with the volumes consumed in contract workers' households, this lack of information does not affect the overall picture about use of milk as means of payment for farm labour.

[30] Uppsala Regional Archive, Parish catechetical lists, Alsike parish, AI:11–14 and AIIa:1–4 (1871–1920); Krusenberg archive, F3:1 (estate inventory, 1892), and dairy journal.

[31] The dairy journal shows that buttermilk was only consumed in the summer, which suggests it was served as refreshment during harvest. This practice is described in answers to ethnological and linguistic questionnaires, Swedish Institute for Language and Folklaw, ULMA No 1, Dairying.

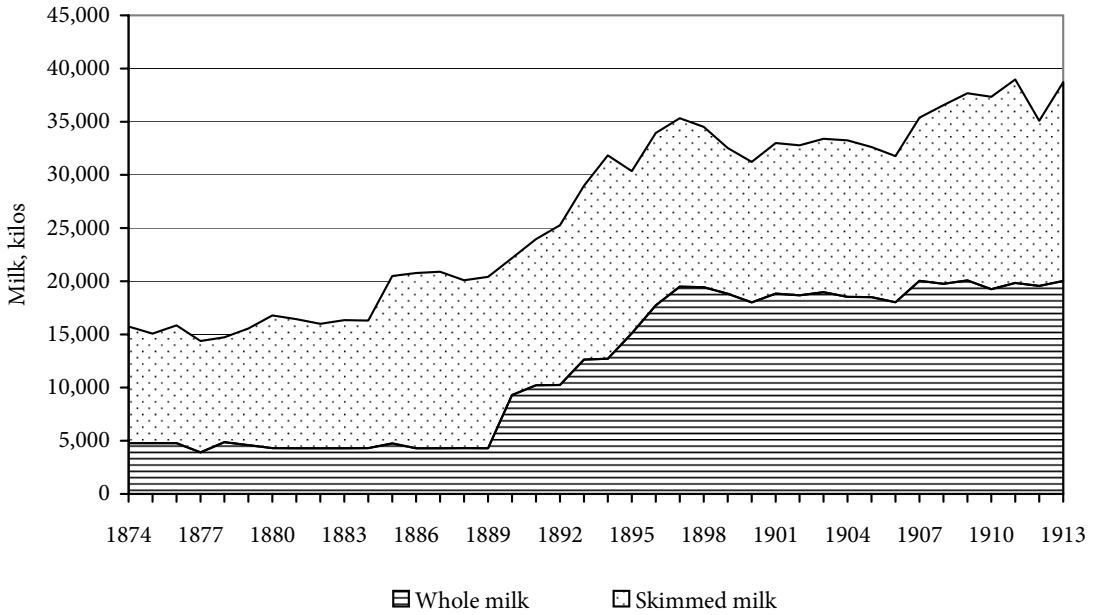

FIGURE 9. Kilos of whole and skimmed milk paid to contract workers at Krusenberg, 1874–1913.

Source: Calculated from dairy journal.

VII

Of all whole milk used in kind, 75 per cent (11 per cent of total milk production) was used in payment to contract workers. Corresponding figures regarding skimmed milk were respectively 53 per cent and 18 per cent.[32] It is unclear how employees with separate households such as estate managers were provided with milk. The most plausible explanation is that those people who were neither members of the estate household nor contract workers were supplied with milk from their own cows. This conclusion is supported by a comparison of the numbers of households receiving milk and a detailed estate account for the years 1873–89.

Total quantities of milk paid to contract workers at Krusenberg between 1874 and 1913 are presented in Figure 9.[33] The diagram demonstrates two levels of consumption, a stable low level during the 1870s and '80s, and a considerably higher level after the turn of the century. In between, the 1890s stands out as a transitional period when the total volume rose fifty per cent, due to dramatically increased quantities of whole milk. In the space of a year, 1889–90, the amount of whole milk allocated to contract workers was doubled, and within less than a decade, the quantity more than quadrupled.

Four reasons can be suggested for the increased use of whole milk in payment to contract workers at Krusenberg. Firstly, the number of contract workers may have increased in line with an increase in the herd size and a possible intensification of arable farming in order to supply it with fodder. Second, the number of workers who had their meals in the estate household may

[32] Dairy journal.

[33] Dairy journal.

have been reduced and replaced by a corresponding rise in the number of separate households, treated as contract workers in the dairy journal. According to Table 4, the number of contract workers' households increased only slightly, by 14 per cent from 1887 to 1900, which does not explain 60 per cent higher total volumes and a tripled quantity of whole milk. Consequently, the increased milk volumes cannot be explained by a transfer of consumption from the estate household to contract workers' households. Neither does the limited increase in the number of contract workers' households allow for a third possible explanation, a transfer of employment from crofters to contract workers. Such a tendency has been demonstrated by Eriksson and Rogers, who point to a diminished number of crofters but increased number of contract workers during the later decades of the nineteenth century. Ulf Jonsson has refined this interpretation and argued that the organization of labour at estates in Central Sweden varied from estate to estate. A relatively stable combination of crofters and contract workers was sought all through the nineteenth century.[34] At Krusenberg, parish catechetical lists demonstrate that the practice of employing crofters was maintained into the twentieth century. Seven families were established as new crofters during the 1920s.[35]

None of these explanations for the increase of milk consumption on the estate is convincing. A fourth explanation, that improved rations per household should be regarded as a conscious strategy by the managers of the estate, is more plausible. This explanation relates the increased use of whole milk after 1890 to the coincidental transfer of the management of the estate to the proprietor's son. Is it possible that the younger generation implemented an increased use of the commercially-valuable whole milk to pay workers? This suggestion is supported by the authorities in agricultural economics, Juhlin-Dannfelt and Sjöström who, at the turn of the century, recommended increasing rations of milk in place of wage rises. They stressed the importance of providing the workers' families with whole milk, especially households with children.[36] Such a recommendation may reflect not only a concern about the families, but also an effort to prevent contract workers leaving farming for the expanding urban industries.

A study of the payments in kind paid to contract workers at other Swedish farms confirms that similar strategies were practiced. Table 3 compares figures from Krusenberg and the volumes discovered by the questionnaire mentioned previously, circulated at the end of the 1930s. Because of the character of the questionnaire, figures from only nine farms could be related to a specific decade.[37] The answers to the questionnaire show a range of variation between farms in the quantity of milk given to estate workers, the balance between whole and skimmed milk and moments at which the amounts of milk were increased.[38] An upward trend

[34] Ingrid Eriksson and John Rogers, *Rural labor and population change: social and demographic developments in east-central Sweden during the nineteenth century* (1978), App. B, Table 3, pp. 256–60 and Ulf Jonsson, *Jordmagnater, landbönder och torpare i sydöstra Södermanland, 1800–80* (1980), p. 89f.

[35] Uppsala Regional Archive, Parish catechetical list, Alsike parish, AIIa:5 (1920–8).

[36] Juhlin-Dannfelt and Sjöström, *Handbok i jordbruksekonomi*, p. 416 f. The recommendations were published more than a decade later, but may have been discussed and applied earlier.

[37] Nordic Museum, Stockholm, NM 82, Contract workers.

[38] Such variations in volumes between farms in southern and central Sweden are in contrast to observations by Lundh and Olsson, 'Contract workers', p. 5, reporting that 'quite stable' quantities were paid in kind in the Scania region in the very south of the country.

TABLE 3. Total volumes, per household, per day, of whole and skimmed milk given as payment for farm labour at Krusenberg and nine Swedish farms

	1870s	*1880s*	*1900s*	*1910s*
Krusenberg	3.6	3.9	5.6	8.8
Questionnaire NM 82	3.5	3.6	5.7	6.0

Sources: Dairy journal and Nordic Museum Stockholm, questionnaire NM 82, Contract workers.

in quantity of milk provided is clearly shown by the average figures in Table 3. The table also shows a broad similarity between figures from Krusenberg and averages from the questionnaire. The figures regarding the early twentieth century also correspond with examples published in 1909–11 and recently discussed by Christer Lundh and Mats Olsson.[39] There is a difference though between figures from the estate and those given by the questionnaires concerning the proportions between whole and skimmed milk given in payment. During the 1870s and '80s only a quarter of the quantity given in the payment at Krusenberg was whole milk, compared with about half at the nine farms described in the questionnaire. Later, in the early twentieth century, the proportions were similar, about half of the volume paid as whole milk and half as skimmed milk. The increased use of milk as a form of payment at Krusenberg thus seems to reflect a general tendency, although the timing – in this particular case – was determined by the change in management after 1890.

Despite the fact that both increased volumes and larger proportions of whole milk resulted in diminished cash income from dairying, these changes does not seem to have been subject of much debate. A search of the farmers' journal *Tidskrift för landtmän* for 1880–1913 did not reveal any discussion of this particular subject.[40] Some articles debated 'the labour question', which shows that this journal would have been an appropriate forum for any discussion of milk payments. Later, in the 1930s and early '40s, the farm labourers' organization pursued an intensive debate about the contract system, which ended with the abandonment of the system in 1945. This was a debate on farm workers' freedom and living standards, not about the character of payments in kind. Neither was the principle of using milk as payment questioned in another farmers' journal, *Mjölkpropagandan*. This frequently reported on milk volumes and dairy consumption during the inter-war period, but without any discussion of the extent to which milk was used on the farm.

The relevance of the quantities paid to contract workers at Krusenberg can be discussed on the basis of Table 4, which shows the number of households and household members as well as the amount of milk per household and person between 1873 and 1913. According to the parish catechetical lists, average household size was 4.6 people in 1873 and slightly below four at the three other points in time. Household size varied between two and eight members.

The estate archive does not offer any information about the quantity of milk provided to

[39] Juhlin-Dannfelt and Sjöström, *Handbok i jordbruksekonomi*, pp. 409, 415; Lundh and Olsson, 'Contract workers', p. 5.

[40] 1880 was the first year of publication. The journal circulated nationally, although primarily among men responsible for large farms.

TABLE 4. Number of contract workers' households, household members and average daily volumes of whole and skimmed milk per head, Krusenberg

	1873	*1887*	*1900*	*1913*
Households	12	14	16	12
Household members	55	54	62	46
Whole and skimmed milk, person/day	0.79	1.02	1.46	2.30

Note: figures are for years ending 31 December. The use of late 1873 is explained by the fact that the estate used November-October as the financial year. In this article, November and December 1873 are regarded as 1874, although the parish catechetical list refers to December 1873.
Sources: Dairy journal and Uppsala Regional Archive, parish catechetical lists, Alsike parish, AI:11 and 14; AIIa:1 and 4.

individual households and so it is impossible to relate the quantity provided to household size. In fact, the questionnaires found that milk quantities at a farm were often fixed, irrespective of household size. Thus, daily volumes per household may have been insufficient for large households but more than adequate for small ones. The lowest quantity that may be distinguished from the estate archive was half a litre per head, mostly skimmed milk, paid to families with five or six children living at Krusenberg in 1873 and 1887. By 1913, people living in households with two members had access to 4.4 litres per day, of which half was whole milk.

According to this same questionnaire and another asking about dairying and eating habits, milk and milk products were regularly used in rural Swedish households. When milk was available, it was used for porridge, pancakes, soup, varying kinds of fermented milk, cottage cheese and, if possible, a little butter and hard cheese. Milk was also poured into bottles for children and adults for lunch in school or outdoors.[41] The wide use of milk suggests that the volumes provided before the early 1890s must have been insufficient for families with children. Complaints about lack of milk frequently occur in discussions of contract workers. The questionnaires also offer examples of workers buying extra milk with their limited cash income. On the other hand, members of small households could use their milk to make butter and cheese or even fatten a pig or calf. According to a printed employment contract from 1922, attached to the questionnaire about contract workers, it was by that time possible for the labourer to sell surplus milk back to the farmer for cash.[42] Obviously, the increased volumes of milk provided during the later part of the period offered opportunities for a better standard of living for contract workers' households. But there can be no doubt that the practice of paying people in kind continued to be a way in which landowners exercised power and restricted the workers' freedom.

[41] Nordic Museum, Stockholm, questionnaire NM 82 and Swedish Institute for Language and Folklaw, questionnaire ULMA no 1.

[42] Nordic Museum, Stockholm, NM 82.

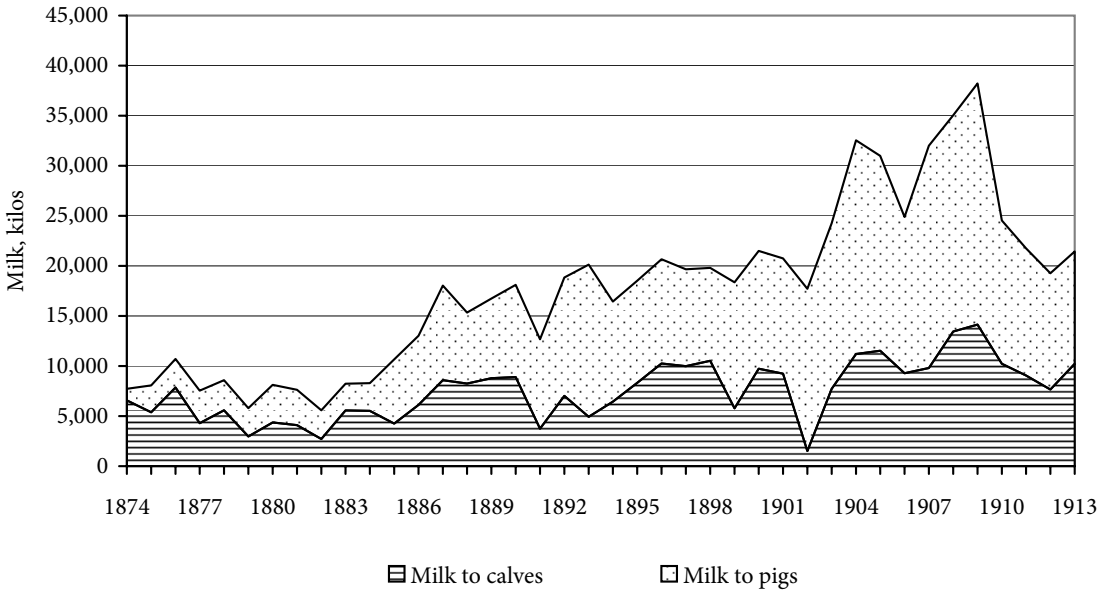

FIGURE 10. Whole milk, skimmed milk and buttermilk used as feed for calves and pigs at Krusenberg, 1874–1913.

Source: Calculated from dairy journal.

VIII

Milk was regularly used as feed for calves and pigs at Krusenberg. From the early 1890s onwards, trivial quantities were given to sheep, poultry, foals and dogs (Table 2). Most of the milk used in this way was given to calves and a smaller quantity to the pigs. Over the whole period 1874–1913, 92 per cent of the whole milk used as feed was given to calves and only 8 per cent to pigs. A closer analysis of the dairy journal shows that much less milk was given to the calves after the change of management in the early 1890s. The new proprietor evidently reconsidered how milk might best be used. Pigs were fed with limited volumes of whole milk throughout the period, except for a peak in 1893, which may be interpreted as a feeding experiment by the new proprietor. On the other hand, pigs consumed 96 per cent of all buttermilk used in kind. Total use of whole milk, skimmed milk and buttermilk as feed for calves and pigs, is presented in Figure 10, which shows that the total volumes fluctuated over time. The variations indicate that milk used as animal feed had the character of a buffer to soak up surpluses, and the quantity used rose and fell in line with milk production at the farm, and the price of dairy products, veal and pork. The small quantity of milk given to calves in 1903 is explained by consequences of contagious abortion that struck the herd badly and resulted in a loss of about one third of the calves.[43]

The great share of milk used for calves does not imply the large scale fattening of calves. With an estimated average number of 50 calves born per year, each calf could consume 150 litres (four

[43] Krusenberg archive D4:2. (stable journal).

litres per day of whole or skimmed milk over five weeks). According to the rules for feeding calves at Krusenberg, calves were to be fed with milk until three months of age, so each one consumed 314 litres.[44] This means that not all calves can possibly have been reared to heifers, or fattened. Some of the newborn calves must have been slaughtered early, whilst others were reared into new dairy cows. Only a small number were fed to make veal. The fattening of pigs may be regarded as a conscious strategy to make use of the low-value buttermilk, of which only 14 per cent was marketed.

IX

Krusenberg was adapted to commercial butter production relatively early. The estate's butter almost certainly found its way into the export trade. A central argument of this article is that the development of commercial butter production at Krusenberg did not mean that production for internal use was abandoned. On the contrary, it continued and even increased over time. The use of milk as a means of payment may be interpreted as a conscious and modern strategy. Yet, the use of products in this way also illustrates the strong continuities with traditional rural practices; a striving to minimize cash expenditures and make as much use as possible of internally-generated products and services.

Three periods of change have been identified as being of particular importance. The process of commercialization started in the 1860s and 1870s when basic investments were made: an estate dairy and a large cowshed. At this time the volumes paid in kind to estate workers were kept on a low, stable level. A second period from the early 1890s onwards was marked by extended commercial production in combination with strongly increased rations of whole milk to contract workers. Finally, the first decade of the twentieth century has been identified as a period with a high, but stable level of milk rations.

To what degree does this study of Krusenberg mirror dairy economies at other large Swedish farms? The system of employment using *statare* was practiced on almost all large farms. According to examples of rations given to contract workers at other farms, the volumes of milk paid in kind generally increased over time. Such an increase may have been related to more or less conscious calculations of the profitability of such a strategy or to meet the pressure from the farm labour organizations. Increased volumes of milk were used internally on Swedish farms at a time when commercial trade was expanding. Such a farm economy implies that the Swedish potential for commercial production was not fully realized. This view is strengthened by figures reported in *Mjölkpropagandan* in 1929 that only about 40 per cent of the total Swedish milk production was delivered to dairy plants while 60 per cent was consumed by rural citizens, animals, used for farmhouse butter- or cheese-making, or sold directly to urban consumers.[45] Thus, the Swedish impact on the international market, and the distress it caused British farmers, was much less than it might have been if almost all Swedish dairy products had been marketed. Even though the Swedish butter exporters were selling into one of the most highly commercial economies in the world at that time, we have the paradox of the co-existence of commercial

[44] Krusenberg archive D:5 ('Instructions for feeding of calves').

[45] *Mjölkpropagandan* 9 (1929), p. 171.

production with the survival of archaic and backward systems of employment inherited from earlier generations. In these respects, the Swedish dairy industry before the First World War was incompletely commercialized and far from modernized. It was to remain so for a further generation.[46]

[46] Carin Martiin, 'Specialization in dairying', a paper read at a PROGRESSORE conference in Rennes and forthcoming in the proceedings edited by Annie Antoine; Karl Amark, *Kristidspolitik och kristidshushållning i Sverige under och efter andra världskriget* [*Crisis politics and economy during and after World War II*], SOU [Swedish Government Official reports], 1952:49, vol. I.