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# The Strange Birth of Liberal Denmark: Danish trade protection and the growth of the dairy industry since the mid-nineteenth century<sup>1</sup>

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**Abstract:** The usual story of the “first era of globalization” at the end of the nineteenth century sees Denmark as something of an outlier: a country which, like Britain, resisted the globalization backlash in the wake of the inflow of cheap grain from the New World, but where agriculture, rather than going into decline, in fact flourished. Key to the success of Danish agriculture was an early diversification towards dairy production. We dispute this simple story which sees Denmark as something of a liberal paragon. Denmark’s success owed much to a prudent use of trade policy which favoured dairy production. Moreover, this favouritism continued even after a more general movement to free trade in the 1860s. Using micro-level data from individual dairies, we quantify the implied subsidy to dairy production from the tariffs, and demonstrate that this in many cases ensured the profitability of individual dairies.

**JEL codes:** N5, N7

**Keywords:** Dairies, Denmark, protection, tariffs, cheese

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## 1. Introduction

Denmark stands as a curious outlier in the history of late nineteenth century globalization. After a brief flirtation with free trade inspired by the British repeal of the Corn Laws in the 1840s, many European countries returned to agricultural protection from the 1870s as a response to the inflow of cheap grain from the United States and other new producers. The United Kingdom chose to remain a free-trader, and saw the dramatic decline of her agricultural sector. In this story, Denmark also chose to remain open, but with rather different results.

By the end of the nineteenth century, there was no doubting the success of Danish agriculture, and the British market was crucial for that success. In 1875-79, 49 per cent of Denmark's total agricultural export value went to the UK. By the beginning of the twentieth century, this had increased to 73 per cent, and as much as 90 per cent for specific products such as butter and pork. Seen from the British side, the proportion of butter supplied from Britain was around 15 per cent at the end of the 1870s, but over 40 per cent by the beginning of the twentieth century. For bacon, the proportion rose from under 1 per cent to close to 50 per cent. As Henriksen (1992) suggests, these growing market shares were a "demonstration of the competitiveness of Danish farm products".

Danish farmers succeeded by diversifying into high-quality meat and dairy produce and, from being a net exporter of grains, Denmark now became a net importer, and used this cheap supply to feed the animals her agriculture was to become so heavily dependent on. Thus, by "maintaining free trade, the Danes adhered to a national tradition of liberalism, a reflection of a small economy without any domestic mineral resources" (Henriksen 1992, p. 156). By the end of the nineteenth century, Denmark's success in these industries stood as testament to the folly of the return to protectionism in other countries (Persson 2010). We aim to nuance this simplistic interpretation of Danish success. Trade policy did, in fact, play a vital role in the early history of the Danish dairy industry. Moreover, the establishment of a dairy industry was vital for the later success of Danish bacon.

To demonstrate this, we go back before the breakthrough of Danish agriculture in the 1870s, and reemphasize an important but often neglected point: that Denmark was diversifying towards dairy production from an early date, and this meant that she was in a privileged position when opportunities for dairy expansion presented themselves in the second half of the nineteenth century. The importance of the early beginnings of the shift of Danish agriculture has been recognized by Danish economic historians. For example, Henriksen (1992, p. 159) writes:

“One implication of the early reorganization of production is that the time- and capital-consuming process of building up herds of milk cows was well underway before the introduction of modern dairy technology impelled animal husbandry towards further productivity gains. It may have provided Danish farmers with an advantage over their competitors in Britain and The Netherlands, where the number of livestock per person... was lower in 1870.”

Since Denmark’s decisive movement to free trade happened in 1864 (see for example Lampe & Sharp 2009), early protection for the dairy industry might have been crucial if it was at the expense of other branches of agriculture: we demonstrate that this was indeed the case. Furthermore, we document that this tariff support continued even *after* 1864, with the maintenance of a tariff on cheese. Using micro-level data from individual dairies, we quantify the value of the implicit subsidies to dairies implied by the tariffs from 1850-1898 and demonstrate that it exceeded the level of profits in many cases. Far from being a liberal paragon, Danish success owes much to the protection afforded by her tariff laws. Moreover, contemporaries were aware of this, as we also document.

## **2. The traditional story**

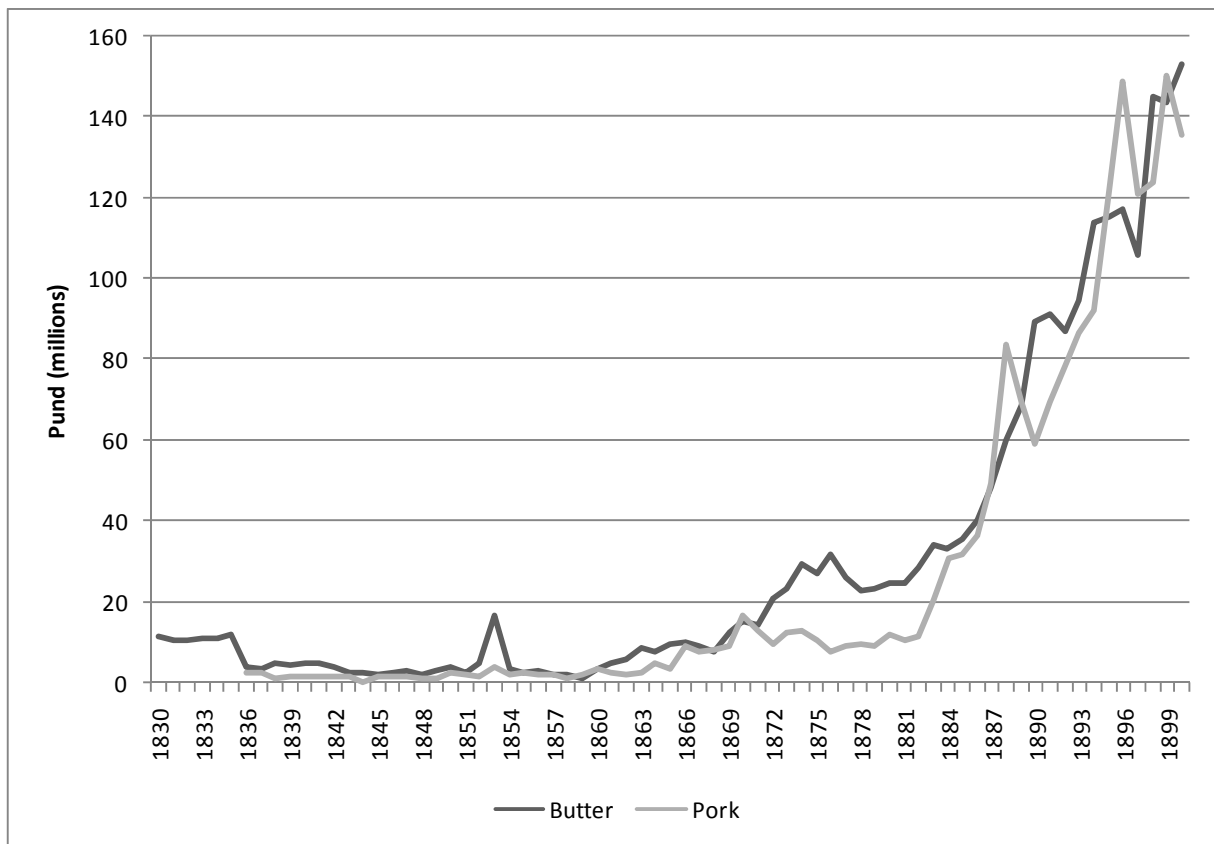
The traditional story tells how Denmark went through a long “crisis of grain sales” of ca. 1876-94 which incited a diversification of agriculture into dairy and meat production (Hansen 1984, p. 184). The reasons given for why Danish agriculture succeeded in adapting to the challenges of the second half of nineteenth century are commonly given as follows (adapted from Bjørn 1988, pp. 348-9):

1. Land reforms meant that holdings were large enough to be able to benefit from new technologies.
2. Peasant emancipation meant that decisions and financing could adjust more easily.
3. Farmers enjoyed a high education level.
4. There were no grain tariffs, thus allowing the use of cheap grain for feeding the animals involved in dairy production.
5. There was public support for research and research institutions.

We dispute none of these.

The timing of this change is often dated from around 1870, which saw the beginning of large scale exports of butter to the UK, followed by a boom in pork (especially bacon) exports in the 1880s: see figure 1.

**Figure 1: Danish exports of butter and pork, 1830-1900**

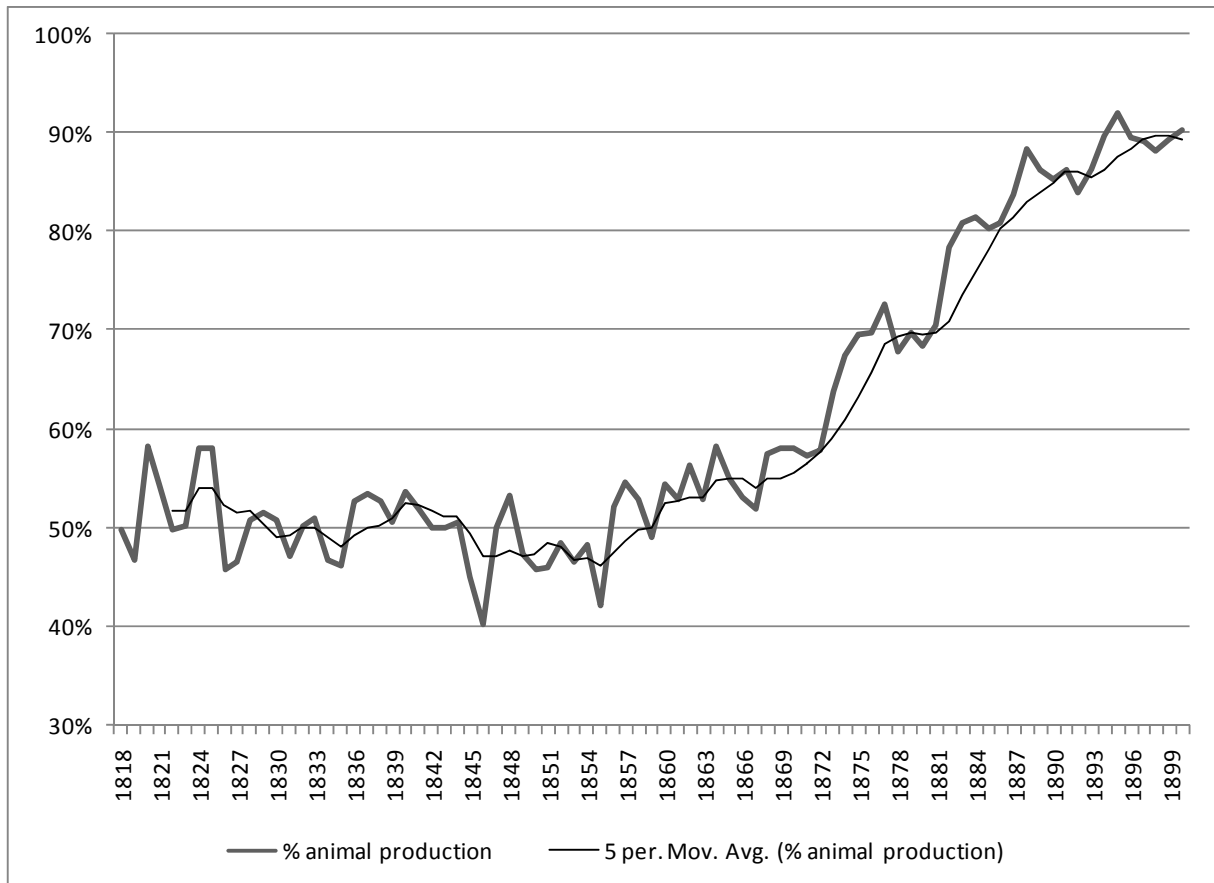


**Source:** Christensen (1985, pp. 88-89)

Transportation improvements in the 1860s facilitated this export breakthrough (Hansen 1984, p. 187) and institutional and technological changes from the late 1870s, i.e. the founding of cooperative dairies and the invention of the mechanical centrifuge for separating cream from milk, ensured the continued success of Danish agriculture.

In reality, however, the shift towards animal products started as early as the 1850s, as others have noted (see for example Olesen 1977 and Nielsen 1977). This is illustrated in figure 2.

**Figure 2: Percentage distribution of agricultural production value to animal products with 5-year moving average, 1818-1900**



**Source:** Hansen (1984, pp. 233-5)

There is a slight increase in the proportion of agricultural income from grains until the mid-1850s, at which point the proportion to animal products increases. Most of this increase initially came from milk and milk products, with pork and pigs increasing from the late 1870s.<sup>2</sup> The number of milk cows increased from around 246 thousand in 1774 to 425 thousand in 1800 and

<sup>2</sup> Nielsen (1977) demonstrated that the shift to animal production varied geographically within Denmark. Also, the goods produced differed regionally.



by the time of the first official agricultural census in 1837, had increased to 569 thousand and then 747 thousand in 1861<sup>3</sup> (Axelsen Drejer 1925-33, p. 225).

The reason for this early shift in production is often attributed to “heroes” of Danish agriculture, such as the large landowner, Edward Tesdorpf. His estates were run as experimental stations, and in various articles from the 1840s he publicized the idea of holding dairy cows, instead of sheep, for fertilizer. He also realized that cows could also be used for other things than simply fertilizer machines, i.e. to produce milk and dairy products. He was also largely responsible for popularizing the idea that improved feed for the cows could increase the production of milk (la Cour 1890). His pioneering work was followed in the 1850s by many articles published on how to run dairies (Bjørn 1988, p. 157).

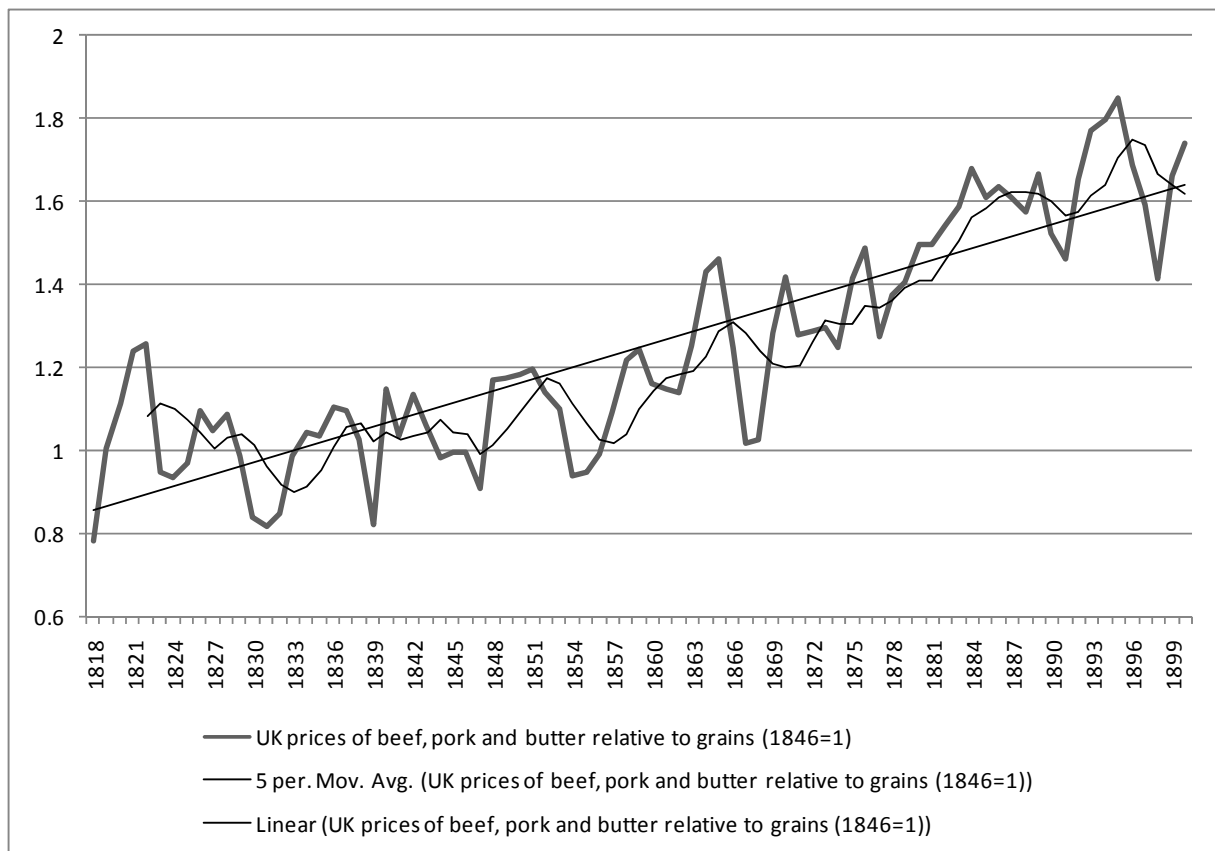
Institutional changes were also crucial for the success of Danish dairies. Before the 1860s, large landed estates established a reputation for producing good quality butter. Their success was emulated from 1863 through the establishment of *fællesmejerier* (private dairies), which bought up milk from the local producers of the area (Bjørn 1977). These later lost ground to cooperative dairies from the 1880s, which were an even more efficient institution and took advantage of new technology for producing butter: particularly the centrifuge (Hansen 1984, p. 189).

We do not want to revisit this story of Danish success from the 1870s and 1880s (see Henriksen 1992). We do, however, ask the question as to why the shift towards dairies began so early in Denmark, so that there was such a strong base for the later take-off. Attempts to understand this early shift have been rather limited. Early accounts stressed the hypothesis of soil “overexploitation” during the period of grain export, but this was convincingly shot down by Jensen (1988, pp. 284-86). More recently, historians have looked at price developments. The prices of animal products did indeed rise rather more than those of grains, as illustrated in figure 3. We use English prices because they reflect the development of Denmark’s most important export outlet.

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<sup>3</sup> Not including the Duchies of Schleswig-Holstein.

**Figure 3: Price of animal products relative to grains in England, 1818-1900**



**Source:** See appendix.

This change in relative prices might be explained by the larger income elasticity of animal products, combined with rising incomes in Denmark and abroad (Henriksen 1992, p. 159).

Although improvements in shipping might be related to the increase in exports, they do not seem to be able to explain the early move to animal products. Prior to 1864, Danish butter was exported to England via Hamburg, and it was only after 1864 that regular steamship connections with the UK were established from Denmark (Dybdahl 1946-47, p. 104). Tesdorpf himself and his *Landhusholdningsselskab* established a route in 1865, but mainly for living cattle (Bricka 1903, p. 137). Moreover, it was not until 1868 that a law was passed for establishing a harbour in Esbjerg, and this was not opened until October 1874 (Nüchel Thomsen & Thomas

1966, p. 169). It seems, therefore, as if the shipping lines to Britain were more a consequence of the new goods for export, rather than a factor in determining them.

This lack of a convincing explanation for the Danish move to animal production leads us to examine another possibility: trade policy.

### 3. Tariffs and protection of the Danish dairy industry

Denmark had, in fact, a long tradition of supporting dairy production, despite an early liberal reform of the tariff laws in 1797.<sup>4</sup> Historians have shown that subsequent reforms always went in the direction of lower protection, but of course when assessing the support for individual industries it is the *relative* protection which mattered. So, for example, already in 1820 dairies benefitted when the export tax on butter and cheese was abolished, and in 1825 an indirect export subsidy on butter was given, by allowing duty free imports of one barrel of Lyneborg salt for every 25 barrels of butter exported (Axelsen Drejer 1925-33, p. 204). The tariff law of 1838 reduced the tariff rate on butter slightly, left the cheese tariff unchanged and reduced the rates on processed grains considerably. In 1846, duties were abolished on unprocessed grains, which clearly benefitted animal production in relation to grain production as previously noted.

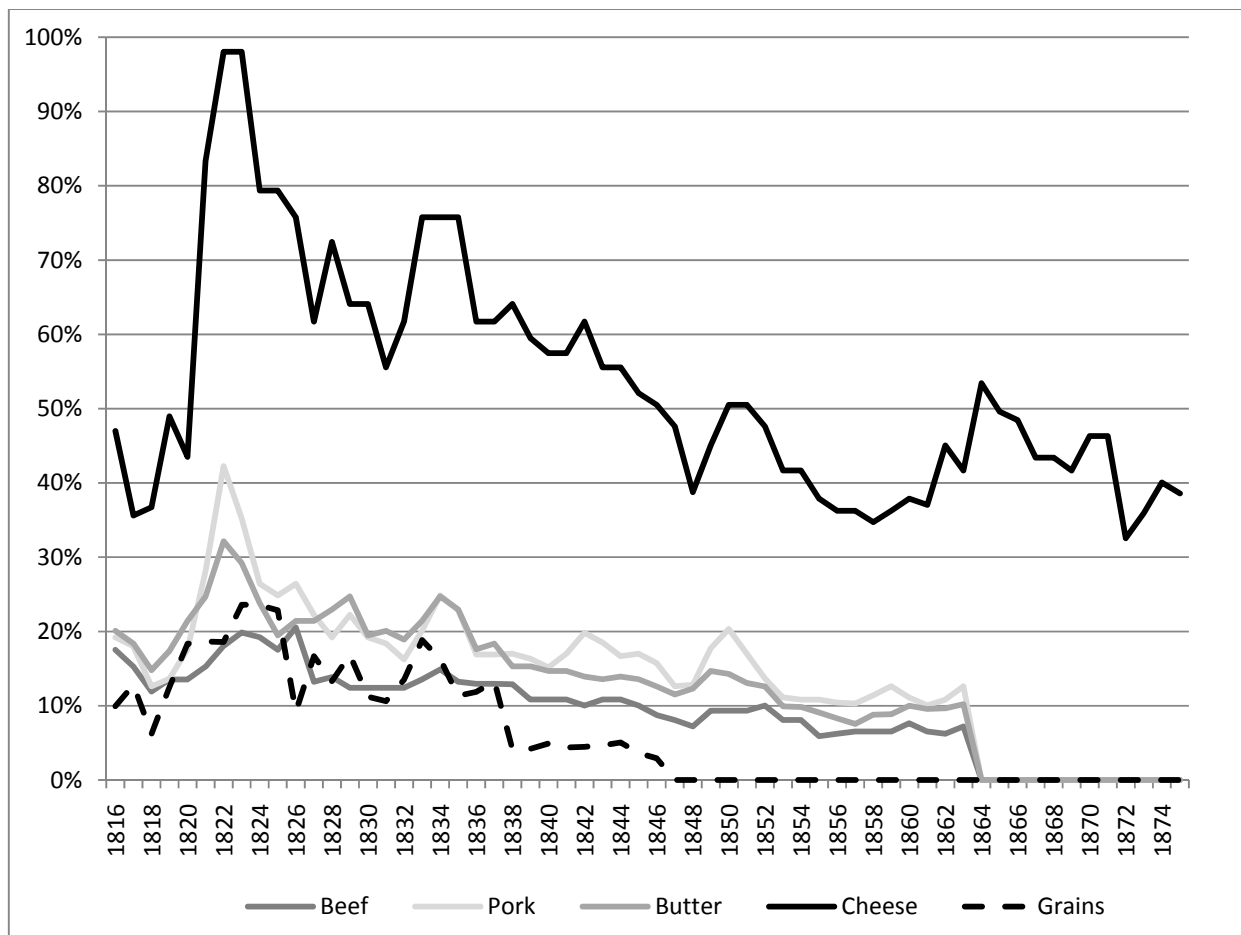
Before continuing, it is helpful in order to understand how Danish tariffs helped protect the dairy industry to know something of the process of making butter. The all-important inputs were of course the cows, for providing the milk, which in turn consumed grass during the summer, and grain during the winter. Butter is made from cream, leaving two by-products: buttermilk and skimmed milk. This skimmed milk could be made into cheese, leaving whey. Whey could be made into whey-cheese (famous in Norway as *myseost*), but in Denmark was more commonly used along with the buttermilk to feed pigs.

The main products of Danish dairies were thus butter, cheese and pork, with beef as an obviously related product. As figure 4 shows, all four were protected until 1864. Moreover, dairy inputs, grains, enjoyed rather low tariffs and were free of duty from 1846.

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<sup>4</sup> See Lampe & Sharp (2009) for more on Danish trade policy

**Figure 4: Ad valorem equivalents of the tariffs on butter, cheese, pork, beef and grains, 1816-1875**



Source: See appendix.

The tariff law of 4 June 1863, implemented the following year, has mainly been analyzed in terms of its importance for Danish industry, since imposing specific tariffs by weight meant that the greatest protection was for low quality, cheap industrial produce. Moreover, with declining prices for manufactured goods, the effective protection was increasing over time (Hyldtoft 1999, p. 160). This law survived almost unchanged until 1908, with the exception of a change in the duty on sugar in 1891 and the so-called “war tax” of 1864. Although agricultural goods were free of duty after 1863, cheese was a notable exception. This was of course protection of the

dairy industry, especially since the inputs (milk, and grain to feed the animals) were duty free.<sup>5</sup> Cheese seems to have received tariff treatment like a luxury good (along with products such as tobacco and sugar with accordingly high ad valorem rates).<sup>6</sup> What was, however, a substantial duty on high-quality imported cheeses was a prohibitive barrier to the import of low-quality cheese. The price series used to calculate the AVEs in figure 4 are those for Danish cheese. The decrease after 1821 is due to increasing prices rather than decreasing tariff rates – in fact, the nominal tariff rate on cheese was even increased by 25% in 1863.<sup>7</sup>

How important was cheese, however? Cheese was not of importance as an export commodity in Denmark – see figure 5 – which has meant that it has been somewhat overlooked in the literature. The specific nature of the tariff of 1863, and prior to this date, meant that cheap cheeses faced effectively prohibitive trade barriers, and caused Danish producers to specialize in low-quality cheeses – an argument akin to that long recognized for industrial protection (see above). Only in the summer, when there was plenty of milk and butter prices were thus at a low, did some dairies produce cheese with a higher fat content. Even this was mostly sold to the neighbourhood (Burchardt 2005, p. 5).

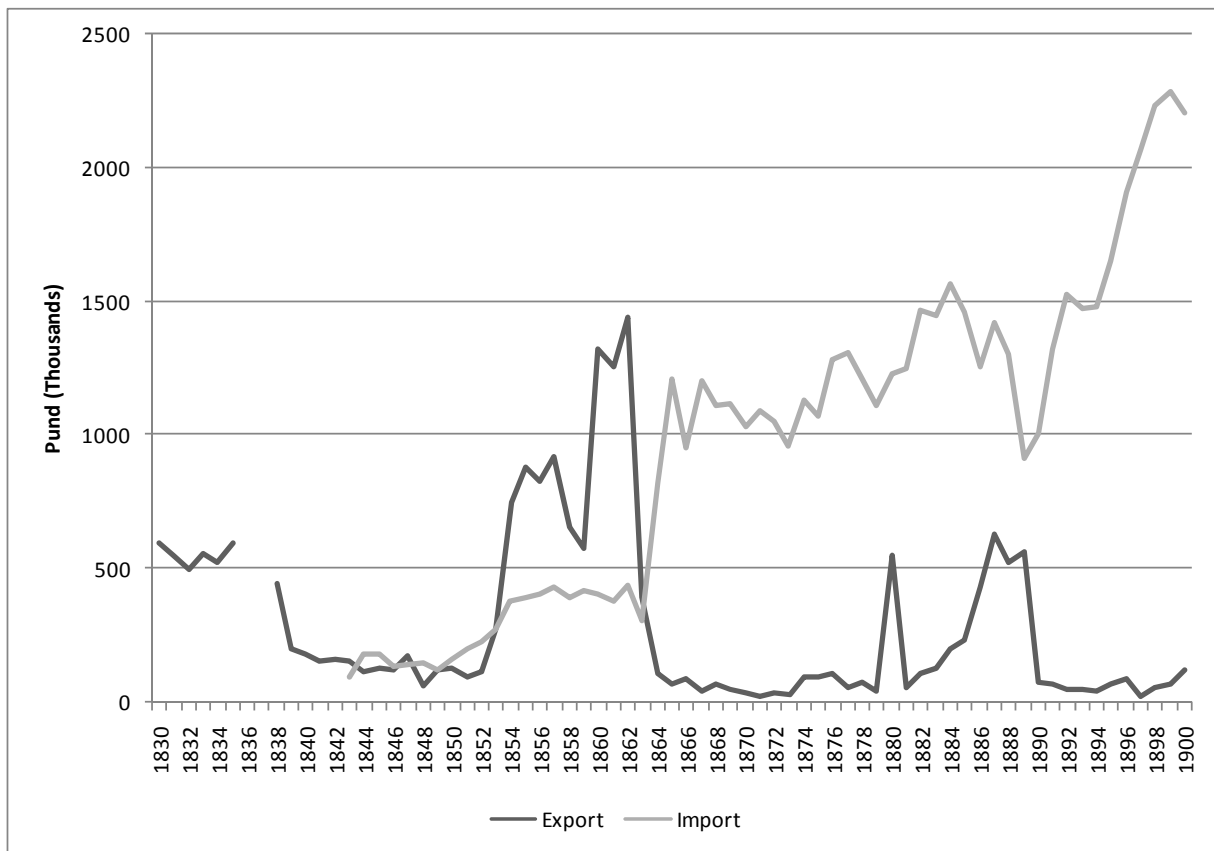
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<sup>5</sup> Thomsen (1991, p. 37) seems to have been the only scholar to recognize this point before.

<sup>6</sup> The official price estimates used to value Danish foreign trade tellingly illustrate the difference between imported and domestic cheese: While imports were priced at 0.25 rigsdaler (0.50 dkk) per pund in 1857, exports were valued at 0.10 rigsdaler (0.2 dkk). In 1875, imports were valued at 0.67 dkk per pund, and exports at 0.24 dkk per pund. Hence, Danish authorities estimated the value of the cheese imported at the high tariff rates to be 2.5 to 2.8 times the value of domestic export quality cheese.

<sup>7</sup> The rate before was 4 rigsdaler 16 shillings per 50 kg, after it was 5 shillings per pund. A shilling was 1/96 of a rigsdaler, which was converted to the Danish kroner in 1873 at 1:2.

**Figure 5: Imports and Exports of Cheese, 1830-1900**



**Sources:** Christensen (1985, pp. 88-89 & 94-95).

**Note:** The picture is distorted by the inclusion of the Schleswig-Holstein dairy industry prior to 1864, after which the Duchies were lost to Bismarck. These areas, according to Tesdorpf (1875, p. 505), always had a surplus of cheese. Moreover, the spike in cheese export in 1880 is probably a mistake in data, since almost all is recorded as being exported in the one extraordinarily atypical month of January 1880 (4:15, p. 40).

The reasons why Danish cheese exports were so unsuccessful is not difficult to explain. By all accounts it was disgusting. It was produced from the skimmed milk left after as much cream as possible was removed in order to make butter, and this skim-milk cheese was tellingly known as “læderost” (leather cheese) (Axelsen Drejer 1925-33, p. 214). Of these, the poorest quality, produced by peasants, as late as the mid-1870s, were described as “never made for sale... There are only small, dry, sharp-edged cheeses hanging from a board under the roof as a great temptation to the sparrows, although even these could only cope with them for the first few

days”<sup>8</sup>. As Jenkins wrote in his report on the Danish dairy industry for the British Parliament, it does “not commend itself to the English palate” (Jenkins 1882, p. 29).

Before 1860 there had been some debate as to whether the dairy industry should concentrate on butter or cheese for export (Bjørn 1982, p. 28) and this debate continued in later years (see for example Tesdorpf 1875). However, it was only after 1900 that there was much increase in the interest for cheese production (Axelsen Dejer 1925-33, p. 405).

Nevertheless, a substantial amount of cheese was produced. Segelcke (1879), as professor of Dairy-Husbandry at the Royal Agricultural College in Copenhagen, was probably the best informed commentator on the state of the industry. He states that the “two principal products of Dairy-Husbandry are... butter and skim-milk cheese”, the production of which was “very considerable”. It might not have been palatable, but it was an almost necessary by-product of butter production, and by virtue of the prohibitive tariff on cheese, Danes were forced to consume it (and many probably knew little else). This implied a substantial subsidy to dairy production, even *after* the tariff reform of 1864.

The importance of the tariff on cheese was understood by contemporaries. For example, there is a revealing discussion recorded in *Tidsskrift for Landøkonomi* in 1876 (Tesdorpf 1876). One speaker, Busck (a merchant), describes how if the tariff on cheese was abolished, then it would be impossible to sell the cheese Denmark produced. He believed that this would (in a similar way to as had happened with butter) force producers to produce better cheese. Another speaker, Broge (another merchant) disagreed, however, and suggested that the threat of abolition itself stopped producers from experimenting with cheese production. Importantly, even that great hero of liberal Denmark, Edward Tesdorpf himself, agreed that abolition would not help produce better cheese, and he cites the example of Schleswig-Holstein, where cheese production, after their separation from Denmark and thus the loss of their protection by the tariff, went into decline. He concludes that he could “in no way support a reduction of the tariff,

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<sup>8</sup> “Kun ses nogle smaa, tørre, skarpkantede Oste hængende paa en Fjæl oppe under Tagskægget til stor Fristelse for Spurvenerne, der dog kun de første Dage kunne binde an med dem.” (Quoted by Axelsen Drejer 1925-33, p. 318. The original source is the *Mejeriberetning* from *Tidsskrift for Landøkonomi* 4:10, p. 553)

and even less a full abolition of the cheese tariff”<sup>9</sup>. Three years later, in their annual report on the dairy industry, the *Mejeriberetning*, the *Tidsskrift for Landøkonomi* suggested that the tariff was necessary in order to allow cheese producers to become established before it was possible to conquer foreign markets – a classic argument for infant industry protection (4:13, p. 58). In fact, in 1887 there were even suggestions that the tariff might be raised, so that experiments with better quality cheese might be made (5:7, pp. 89-90).

In fact, Danish regulatory support for the dairy industry did not stop with the cheese tariff of 1864. In 1885 the margarine law<sup>10</sup> was passed, which came into force on 1 May 1888. This, among other regulations, limited the fat in margarine and forced all retailers who sold it to put up signs in three inch high lettering stating *Her sælges Margarine*, “Margarine is sold here” (5:8, pp. 95-97).

#### **4. The implied subsidy from tariff protection for individual dairies**

We are lucky that several producers understood the importance of keeping accurate and detailed accounts from an early date (see Axelsen Drejer 1925-33, p. 290), and we make use of these from various archival and published sources. Since we have farm gate prices for the majority of the dairies included<sup>11</sup>, we can calculate individual-dairy implicit subsidies scaled to their individual revenues from the three products. We do this by valuing the production of each dairy product (per cow) and using ad valorem equivalents of the tariffs to suggest the proportion of this value attributable to the tariffs. A weighted average (by number of cows) of the available observations each year is presented in figure 6. The appendix gives every observation.

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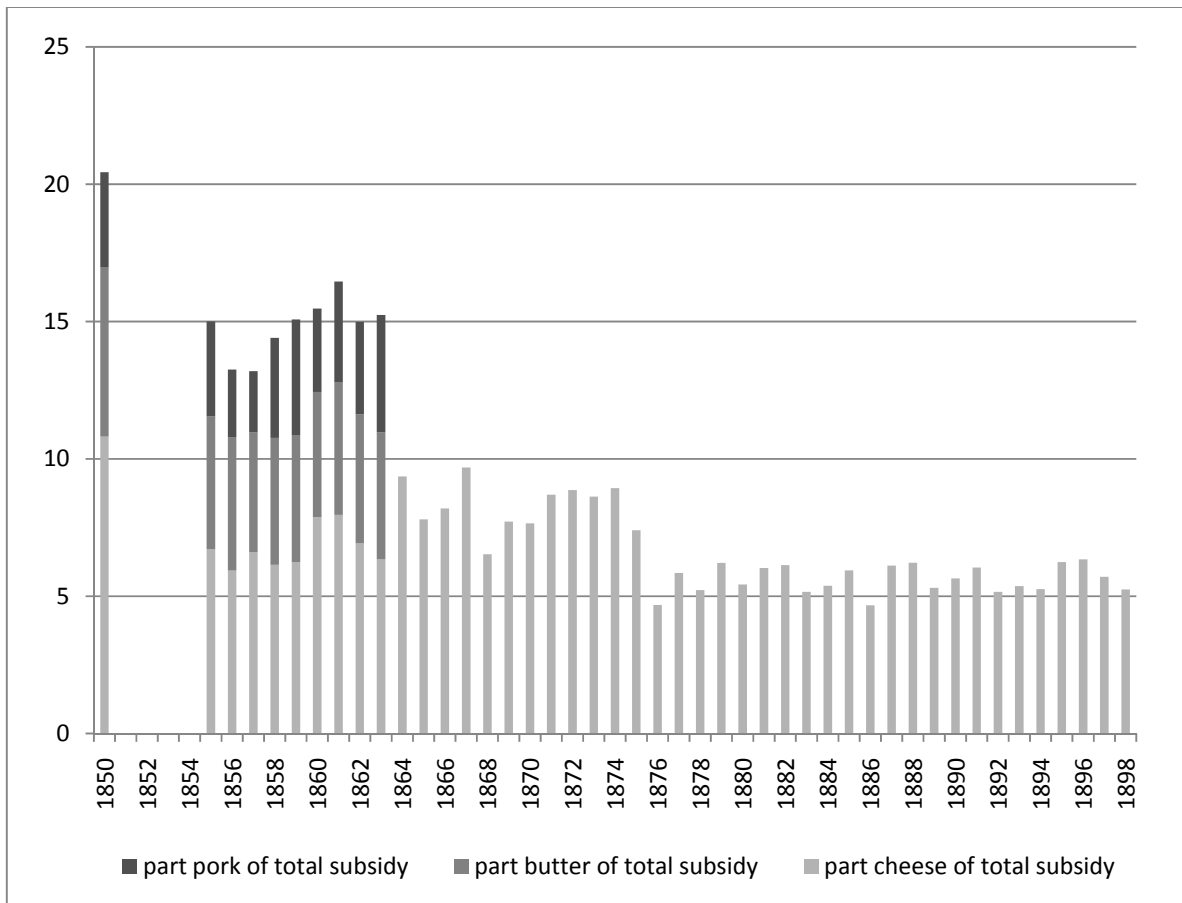
<sup>9</sup> ”...i Modsætning til Grosserer Busck ikke paa nogen Maade kan gaa ind paa en Toldnedsættelse og endnu mindre paa en fuldstændig Ophævelse af Ostetolden” (Tesdaupf 1876, p. 579).

<sup>10</sup> *Loven om Fabrikation, Forhandling og Udførsel af Kunstsmør*

<sup>11</sup> For those where we do not have price information, we can make reasonable assumptions.



**Figure 6: Percentage of total income per cow attributable to the tariffs on cheese, butter and pork**



**Sources:** See appendix.

The calculated value of protection per cow can be compared with the typical profit that could be expected, as revealed in a detailed account of the accounts provided by Jenkins (1876, pp. 26-37) of an individual dairy (Kjærsgaard, nr. Horsens, Jutland). The accounts revealed gross income of £21 7s. per cow, and a profit of £1 5s. 6½d., i.e. just 6% of gross income. The value of the subsidy from the tariffs clearly made individual dairies profitable.

Caution must be taken in interpreting figure 6 as a time series, however, and it is really the full account given in the appendix which is the important record. The number of observations changes almost everywhere, and the sample is also changing with the accounts available to us. See also the notes in the appendix on the construction of the series.

There are good reasons for believing that the series overstates the support for the dairy industry in later years. This is because the sample from our main source (the annual *Mejeriberetninger* or dairy accounts in the *Tidsskrift for Landøkonomi* available from 1876) becomes less representative as more cooperative dairies were established. This problem is first mentioned as a concern in the report for 1890 (5:10, p. 82), but must have been the case earlier. The explanation given in the report for 1891 is that the sample is not intended to be representative, but should rather illustrate dairies with different sizes, technologies, locations, etc. and not model dairies. (5:11, p. 117). In 1894 many older correspondents drop out because they stop being independent (5:14, p. 99), but the basic selection remains the same, inviting much criticism, with the same response again in the report for 1896 (5:16, p. 88).

This is a problem for us, because cooperatives were the main users of a new technology which made cheese production more difficult: the invention in 1878 of the steam-powered centrifuge or automatic cream separator. The adoption of the centrifuge seems to have occurred remarkably quickly. In the report for 1878-9 it is described how only a few centrifuges are used (4:14, p. 54), but already the year after they “play a large role” (4:15, p. 44).

This machine could remove nearly all the butterfat from cream instead of just two-thirds, which was the average of more traditional methods (Bjørn 1988, p. 247). Whilst this led to increases in production and the price (quality) of butter and is considered one of the reasons for the rise of cooperative dairies (Bjørn 1988, p. 324), it meant that cheese became difficult, and therefore more expensive, to make as a by-product of butter production (see also the experiments described by Fjord, 1882, and Storch, 1886). Despite initial fears, it was soon proven by experimentation, however, that this skimmed milk could be used perfectly effectively for feeding pigs (Fjord 1884). Although reports in the early stage focus on the problem of poor handling of cheese (4:10, pp. 318-9 323) and explain how it was not cost effective to feed pigs rather than produce cheese (4:12, p. 91), this soon changes (4:14, pp. 37 & 45). By 1881 cheese is described as being worth much less than pork (5:1, p. 70). Jenkins (1882, p. 30) describes how dairy factories with cream separators were “somewhat careless about the manufacture of skim-cheese, which was only made occasionally, and then, as it seemed to me, rather badly” and that

it was necessary to add “butter-milk... to the skim-milk for cheese-making, as the separator so entirely denuded it of cream”. He concluded that “a sufficient time has not yet elapsed to enable dairymen to find out exactly how best to treat skim-milk which is so entirely deprived of its cream as that which has passed through a well-managed separator”. The *Mejeriberetning* for 1882 describes the problems of using skimmed milk from a centrifuge (5:2, p. 56) and the following year how this makes the concentration on butter even more pronounced (5:3, p. 53). There were experiments with adding cheaper fats, but these didn’t seem to work (5:4, p. 65). Instead, the skimmed milk was used more and more for feeding pigs, calves and there were even experiments with feeding children (5:4, p. 69). The report from 1887 notes the fact that many cooperatives produced no cheese<sup>12</sup> (5:7, p. 89). By 1892, reports suggest that the waste products from butter production were now “more frequently used for feeding swine and young stock” (BPP 1893, p. 9). Moreover, by 1897 it seems that Danish cheese could no longer compete despite its protection due to competition from cheap Russian cheese (5:17, p. 78).

Another problem with the data is that, for some years, production of cheese exceeded demand, and this might mean that we overestimate the revenue from cheese production, although this is again from a late date. It seems that excess cheese production often came when pork prices were low. This is the case in 1875-6, for example (4:10, pp. 317 & 322) and in 1878 when cheese became “unsellable” (4:13, p. 54). In 1885 there were large quantities of cheese left unsold and the author scolds producers by saying that it “doesn’t make sense to keep producing a product just because of old habits” (5:5, p. 64). The same was the case in 1886 (5:6, p. 52) and in 1888 (5:8, p. 81). High prices in 1890 again caused many cooperatives to begin making large quantities of cheese (5:10, p. 97), and even greater price increases in 1891 exacerbated this trend, and it is described how cheese became difficult to get hold of, even centrifuge cheese, and that it was difficult to find workers to produce it (5:11, p. 132). This boom inevitably led to bust in 1892: prices fell, but since there were no large inventories, there was no overproduction “like six years previously” (5:12, p. 134). Inventories are however again described as “full” in 1893 (5:13, p. 122-3), and similar overproduction problems are seen in 1896, again caused by low pork prices causing an increase in cheese production (5:16, p. 108).

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<sup>12</sup> Although it also criticizes this for being wasteful.

The problems with overproduction of cheese are attributed in the report of 1885 to the increased income of Danish workers, who had become “too prosperous to consider the simple cheese as a main source of nutrition” and that “trying to change people’s taste” was hopeless (5:5, p. 66)<sup>13</sup>.

However, in many cases for the individual dairy accounts recorded in the appendix, we have the actual revenue from sales of cheese and moreover, excess cheese could be fed to the pigs (5:6, p. 72). Furthermore, since we are principally concerned with the period prior to 1880, this does not impact much on our conclusions: it is clear from figure 6 that the dairy industry enjoyed considerable support until 1864, during which the transformation of Danish agriculture had already begun, and even enjoyed some support after this, despite the long-standing idea that Denmark’s success came as a free-trading country.

The emerging private modern dairy system then generally gave low priority to the production of skim-milk cheese<sup>14</sup>, but instead sent the skim-milk back to the producers, of which a large part was used to feed pigs. It seems that cheese production, and thus the importance of the tariffs, died with the invention of the separator. However, it is clear that in this way the great advances of the Danish dairy industry in introducing new technologies and institutions, which owed so much to the previous expansion under the tariffs, was also the source of the later great increase in pork production. We turn to this point in the following section.

## 5. Cheese making in the cooperatives

In order to document the relative unimportance of cheese making for the cooperatives, and the incentive to move to pork production, we rely on two pieces of evidence: first from the records of the creameries and, secondly, from published statistics. We have extracted information from the books of minutes of the general meeting and the board meetings of 215 cooperative

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<sup>13</sup> “...vil man endelig lave Ost, saa søg da at fremstille et Produkt, der kan afsættes”... “Den danske Kjøbstadarbejder er for godt stillet til at betragte den simple Ost som sit Hovednæringsmiddel.”... “at forsøge at forandre Folks Smag er i Ostespørgsmaalet i Øjeblikket haabløst”.

<sup>14</sup> With a few exceptions. See for example Pedersen (1981), p. 35.

creameries, roughly one in five of the 1100 cooperative creameries that existed around 1900. Although the level of detail in these hand-written records varies considerably from creamery to creamery, they generally give us detailed information about the running of the creamery. Most of the cooperatives in our sample, 138 of 215, were established during the latter half of the 1880s, a period of strong growth. Where possible, we follow the records from these creameries up to World War I. In addition to the archival material on each creamery, we also make use of another data set gathered from *Danmarks Mejeri-Drifts-Statistik* (MDS). This annual national survey of creameries was first published in 1898 and contains accounting results from the previous year. It is based on voluntary reports from the participants and contains information about the financial and technical performance of the cooperatives. At least 140 of the 215 creameries in our sample of minute books are represented at least once in MDS between 1897 and 1904.<sup>15</sup>

By going through the minutes of the 215 cooperative creameries we find references to cheese making in 93 or 43 per cent of the cases. In the MDS for 1903 the share is 47 percent. This small difference can probably be explained by the overrepresentation in MDS of creameries on the island of Funen. In Funen cheese was produced in over 90 per cent of all creameries.

The references are typically found a) In the statutes or bylaws of the creamery; b) In the contract the creamery made with the manager employed. In some cases his employment, among other things, was conditioned on his ability to make cheese, should the creamery wish it. In other cases cheese (like cream and milk etc.) was part of his payment in kind. Finally, his salary might partly depend on his performance in cheese making, either on the quantity made or the sales revenue; c) In the decisions to build a room or a store for cheese.

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<sup>15</sup> We cannot guarantee that this sample is representative. There is some overlap between our sample of minute books and MDS. 98 of the creameries in our sample are represented among the 523 creameries who returned accounts to MDS for the period November 1903 - November 1904. Comparing the mean and variance for the 98 included with the remaining 424 creameries, we find that: means of year of formation, raw milk processed, and butter produced do not differ significantly. The variances are only significantly different for the year of formation, where the variance is greater among the creameries not in the sample.

The following excerpts from the minutes of “Bakholm”, Northern Jutland, we find is illustrative of the development of cheese production in many cases

§ 9 in the statutes of 1898: “Skimmed milk or buttermilk is returned to the farmers, corresponding to half of the raw milk they supply. The remaining part is made into cheese that is either sold or distributed to the coop members.” 1903, decided at an extraordinary general assembly: “it is up to the individual supplier how large a part of the (skimmed milk) he wants returned and how large a part of it he wants to receive in the form of cheese and whey.” 1 March 1909 an extraordinary general assembly decides: “The board of members gets the right to limit the making of cheese to 1/3 of a member’s (skimmed) milk if the production gets too large.” 4 May 1909 “Cheese production has to be stopped because the cellar is full.” (Historisk arkiv, Vendsyssel)

The peripheral role of cheese is underlined along with the failure, in the longer term, to sell this inferior product, even on the local market. In the same vein, the creamery “Ellinge-Eier”, Eastern Jutland records how:

In 1887 a general assembly decides that (only) “the amount of cheese should be made that would be consumed by the members in their households” The 1888 general assembly decides that: “Cheese can be produced year round except November and December in as far as it is necessary to supply the members with cheese for their own consumption, and if the weather permits. The members who have received more cheese (in 1888) than according to their raw milk supply have to pay an extra 4 øre per pund<sup>16</sup> in addition to the 8 øre they have paid up already.” (Sognearkivet i Gedved kommune)

Apart from the dairy farmers themselves the only outlet for cheese was normally retail sale directly from the creamery to other local people.

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<sup>16</sup> In 1888 the average farm gate price of cheese as reported in the dairy accounts was 14.8 øre per pund.

We have taken the liberty to interpret the term “cheese” in the minutes as a synonym for skimmed milk cheese, see, also the first quotation. Only in two of the 93 cases is full milk cheese production mentioned. In eight cases, however, a cheese *grocer* is involved. That, at least, signals a wider market for the product, although we don’t know whether it was for skimmed or full milk cheese. The scant attention to cheese grocers is in stark contrast to that of *butter* grocers. Hardly a year passes by without a reference to the grocer in question and to the contract for the delivery of the butter.

Finally, the greater success of other nations in making and exporting cheese had not passed totally unnoticed by the cooperatives, thus, according to the minutes from Kjædeby, Funen:

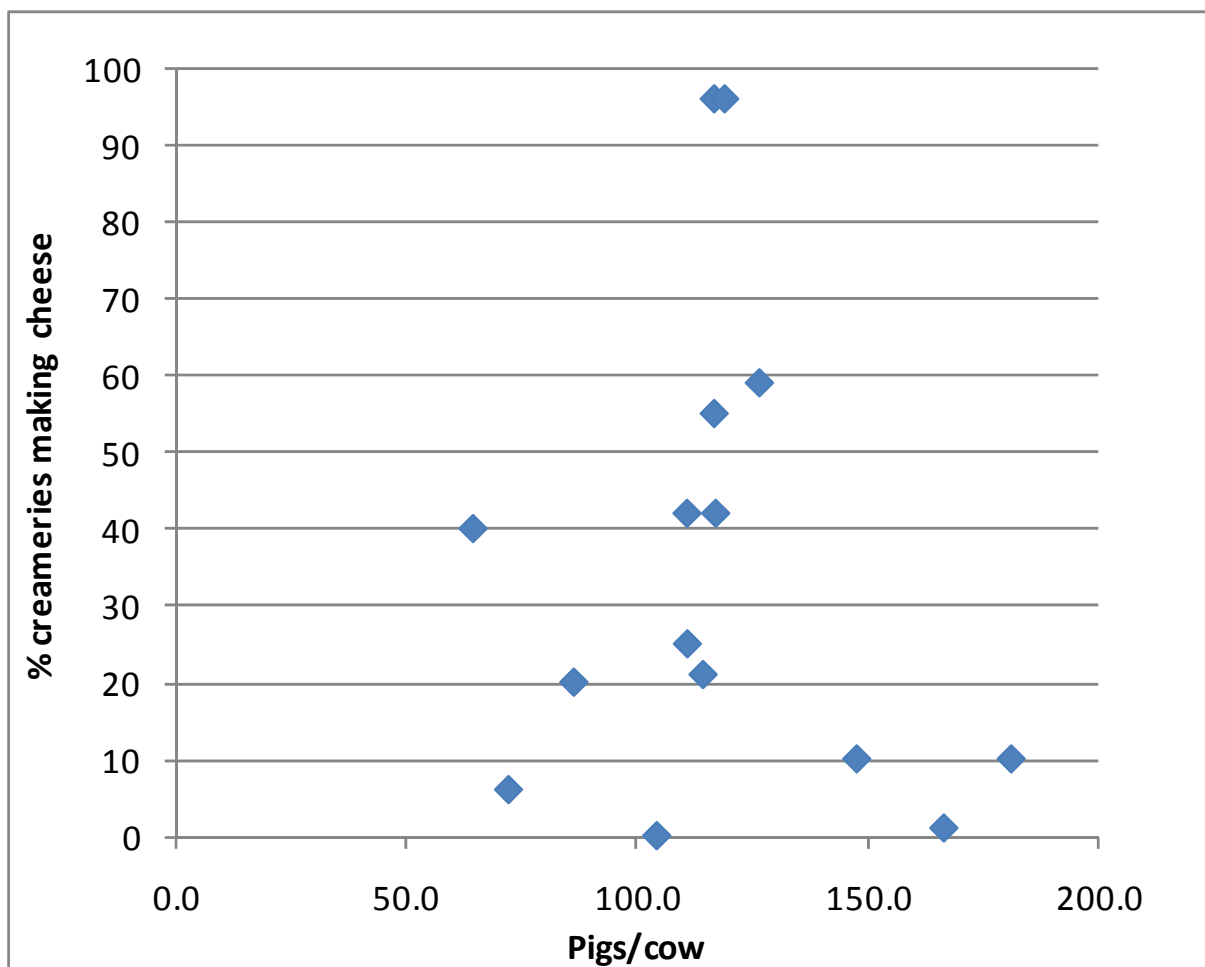
In 1900 the manager “applies to the board to cover the travel costs either domestically or to Holland to make himself familiar with the making of finer cheeses.” It is granted. In 1903 he leaves and buys his own creamery [apparently not a cooperative] (Rudkøbing lokalhistoriske arkiv)

Cheese was, then, clearly not a priority for the cooperatives. It remains, however, to document our hypothesis that the failure of the cooperatives in cheese making was directly made up for by an increase in the production of pigs for marketing at home and abroad. We establish this by comparing the ratio of the number of pigs to the number of milch cows in 1903, a year for which we have information on cheese making from 511 cooperative creameries from the MDS. Unfortunately there is not always a perfect match between the administrative units, the counties, and the regions used in MDS. Nevertheless, the fact that cheese making is highly geographically uneven justifies at least an attempt.

We would not expect a linear relationship, since a relatively low number of pigs per cow would not necessarily imply large-scale cheese production (the waste products from butter production could be used in other ways – for example the skimmed milk could be sold to towns for human consumption). What we should expect, however, is that areas with a large number of pigs per cow should have very limited cheese production, and this is what we do indeed find, as illustrated in figure 7.

Most counties had approximately one pig per cow, and in these places cheese production was either common or very limited. For the three counties with very large numbers of pigs per cow, however, namely Bornholm, Frederiksborg and Præstø we find almost no cheese production – nearly all the skimmed milk was being used to feed the pigs.

**Figure 7: Pigs/cow and percentage of creameries making cheese by county**



Source: See text

## 6. Conclusion

We have thus documented the importance of Danish trade policy for the dairy industry. This support was substantial until 1864 – and this might explain the early diversification of farmers towards dairy production. From this point, through the tariff on cheese, it was less substantial



but still significant until the spread of the centrifuge, which made cheese production less profitable. In this story, Denmark appears not so much as a liberal bastion in the last decades of the nineteenth century (although she was this compared to other European countries), and more as a shrewd utilizer of seemingly innocuous trade policy instruments, providing indirect subsidies to her booming dairy industry in a way that only the most knowledgeable outside observer would have been able to recognize.

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Grains: unweighted average of price movements for Wheat, Barley, Oats (all English Gazette from Mitchell and Dean 1962, pp. 488-9) and Flour (Town Made White from Sauerbeck 1886, 1893, 1901 after 1846, connected with Flour prices in Clark 2004 at index year 1846).

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## Tariffs and AVEs

Tariffs on grains and animal products were specific. These specific rates were assessed from the following sources:

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THORBRØGGER, Schule Theodor (1823). *Tarif for Tolden i Danmark saaledes som den efter de seneste Anordninger erlægges i Rigsbankpenge rede Sølv. Tredie, med mange Tillæg forøgede Oplag*. Copenhagen: Schubothe. (Cheese duty increase in 1821 [p. 63])

BPP 1129/1849. Commercial Tariffs and Regulations, Ressources, and Trade, of the Several States of Europe and America. Vol. 23. Appendices to the Commercial Reports. By John MacGregor, 1-18 (New Danish Tariff of Import Duties, the 1838 tariff).

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Hübner, Otto (1866). *Die Zolltarife aller Länder. Gesammelt, übersetzt, geordnet. Zweite Auflage*, Iserlohn: J. Baedeker. (the new tariff law of 1863, in force since 1 april 1864).

These specific tariff rates have been converted to AVEs using the prices from Hansen's table 15 (see section on prices). Hansen's grain and flour prices are in Danish volume tons, which following Hansen (1984, p. 362) have been assumed to be equivalent to 106.5 kg for wheat, 70 kg for oats, 92 kg for barley and 98.5 kg for rye. The "grains" line in Figure 4 represents a

weighted average of AVEs using 1865 export values as weights: barley 54%, wheat 18%, oats 15%, rye 13%.

### **Minutes of meetings of cooperative creameries**

The minutes of the cooperatives' general assembly meetings and board meetings were found in local archives from all over Denmark, only ten were located in the Danish Business Archive in Aarhus. Information on the existence of the archival material is documented in the database [www.danpa.dk](http://www.danpa.dk) (search 'andelsmejeri'). We chose to read the material from all cooperative creameries that were established in the 19<sup>th</sup> century and followed them, whenever possible, to 1915.

## Appendix: The full series

Year	Farm	Cows (no.)	Production (pund per cow)				Prices (dkk per 100 pund)				Income (dkk per cow)					Subsidy due to import duties (% of net income per cow)				Source
			Milk	Butter	Cheese	Pigs	Butter	Cheese	Pork	from butter	from cheese	from pigs (gross)	from pigs (net)	sum gross	sum net	total	thereof butter	thereof cheese	thereof pork	
1850	Ourupgaard	200	3892	113	140	n/a	61.8 <sup>1</sup>	14.1	n/a	62	16	15	9	93	87	20.4	6.2	10.8	3.5	Tesdorp (1867), p. 30
1855	Ourupgaard	210	3656	123	146	n/a	77.6	16.4	n/a	95	20	45	19	160	134	16.1	4.9	7.6	3.6	Tesdorp (1867), p. 30
1855	Broholm	119	3066	79	55	n/a	75.0	18.8	n/a	60	10	27 <sup>2</sup>	20 <sup>2</sup>	97	90	13.0	4.7	5.1	3.2	LA Fyn, Broholm Sehested (1857),
1856	Broholm	128	2881	81	63	42	81.3	17.7	34.5 <sup>3</sup>	66	11	18	12	95	89	13.3	4.9	5.9	2.5	LA Fyn, Broholm Sehested (1858),
1857	Broholm	122	2824	73	71	48	87.5	19.8	37.5 <sup>3</sup>	64	14	18	12	96	89	13.6	4.4	6.6	2.7	LA Fyn, Broholm
1858	Broholm	116	2826	76	64	n/a	85.7	17.2	n/a	64	11	17	12	92	86	14.4	4.6	6.1	3.6	LA Fyn, Broholm
1859	Broholm	130	2574	79	68	n/a	83.0	19.3	n/a	65	13	(19)	12	97	91	15.1	4.6	6.2	4.2	LA Fyn, Broholm
1860	Ourupgaard	216	4646	165	182	n/a	85.7	18.2	20.5	141	33	37	26	211	200	14.4	4.4	7.6	2.4	Tesdorp (1867), p. 30.
1860	Broholm <sup>4</sup>	129	2925	89	100	n/a	75.7	16.8	n/a	68	17	(23)	15	107	99	17.2	4.8	8.4	4.0	LA Fyn, Broholm
1861	Broholm <sup>4</sup>	130	3192	98	104	n/a	75.5	17.6	n/a	74	18	(25)	16	117	109	16.5	4.8	8.0	3.7	LA Fyn, Broholm
1862	Broholm <sup>4</sup>	130	3138	105	99	n/a	82.7	17.7	n/a	87	18	(23)	15	127	120	15.0	4.7	6.9	3.4	LA Fyn, Broholm
1863	Broholm <sup>4</sup>	137	3455	122	94	n/a	85.4	16.1	n/a	91	15	(26)	17	133	124	15.2	4.6	6.3	4.3	LA Fyn, Broholm
1864	Broholm <sup>4</sup>	120	3339	127	131	n/a	86.3	17.2	n/a	109	22	(20)	13	152	145	9.4	0.0	9.4	0.0	LA Fyn, Broholm
1865	Ourupgaard	219	4764	160	211	n/a	95.1	22.9	25.5	152	37	54	33	242	222	7.5	0.0	7.5	0.0	Tesdorp (1867), p. 30
1865	Gjedsergaard	108	4848	174	155	n/a	95.1	(22.9)	(25.5)	166	36	56	30	258	231	7.0	0.0	7.0	0.0	Tesdorp (1867), p. 30
1865	Broholm <sup>4</sup>	120	3328	125	137	n/a	93.8	18.8	n/a	117	26	(29)	19	171	162	8.8	0.0	8.8	0.0	LA Fyn, Broholm
1865	Søholm	43	4365	144	125	76	82.5	20.0	25.0	119	25	19	(11)	163	154	8.4	0.0	8.4	0.0	LA Fyn, Søholm
1866	Broholm <sup>4</sup>	120	3574	128	128	n/a	99.0	19.6	n/a	126	25	(33)	19	184	170	7.8	0.0	7.8	0.0	LA Fyn, Broholm
1866	Søholm	47	3947	132	148	109	88.9	23.4	25.0	118	35	27	(15)	179	168	9.2	0.0	9.2	0.0	LA Fyn, Søholm
1867	Ourupgaard	221	n/a	163	232	n/a	93.8	17.1	n/a	159	40	59	(34)	258	232	10.4	0.0	10.4	0.0	Tesdorp (1868)
1867	Gjedsergaard	115	n/a	155	201	n/a	92.8	17.7	n/a	150	35	65	(37)	251	223	9.4	0.0	9.4	0.0	Tesdorp (1868)
1867	Broholm <sup>4</sup>	105	3521	131	147	n/a	100.1	18.1	n/a	127	26	(28)	16	181	169	9.0	0.0	9.0	0.0	LA Fyn, Broholm
1867	Søholm	50	4277	138	140	95	87.6	23.7	27.1	120	33	26	(15)	179	168	8.7	0.0	8.7	0.0	LA Fyn, Søholm
1868	Broholm <sup>4</sup>	111	3416	107	110	n/a	101.0	19.8	n/a	108	22	(37)	21	167	151	7.6	0.0	7.6	0.0	LA Fyn, Broholm
1868	Søholm	50	4084	124	61	61	101.9	24.9	33.3	126	15	20	(12)	162	153	4.2	0.0	4.2	0.0	LA Fyn, Søholm
1869	Ourupgaard	220	n/a	163	213	n/a	104.6	21.6	n/a	170	46	(59)	34	275	250	8.9	0.0	8.9	0.0	Fenger (1873), pp. 390-91
1869	Broholm <sup>4</sup>	111	3442	112	82	n/a	106.3	28.6	n/a	119	23	(39)	22	181	164	5.2	0.0	5.2	0.0	LA Fyn, Broholm
1869	Søholm	55	4118	122	126	113	95.1	18.7	33.3	116	24	36	(21)	176	160	8.2	0.0	8.2	0.0	LA Fyn, Søholm
1870	Ourupgaard	222	n/a	175	170	n/a	99.4	20.6	n/a	174	35	(66)	38	275	247	7.2	0.0	7.2	0.0	Fenger (1873), pp. 390-91



1870	Søholm <sup>5</sup>	56	3715	124	148	172	94.4	18.7	33.3	117	28	34	(19)	179	164	9.4	0.0	9.4	0.0	LA Fyn, Søholm
1871	Ourupgaard	220	n/a	164	220	n/a	106.9	20.4	n/a	174	46	(60)	34	281	255	9.2	0.0	9.2	0.0	Fenger (1873), pp. 390-91
1871	Søholm	57	4369	141	125	156	102.1	19.8	33.3	144	25	40	(23)	208	191	6.8	0.0	6.8	0.0	LA Fyn, Søholm
1872	Ourupgaard	220	n/a	181	230	n/a	108.1	20.4	n/a	195	48	(36)	21	279	263	9.3	0.0	9.3	0.0	Fenger (1873), pp. 390-91
1872	Søholm	59	4408	147	143	144	102.7	18.8	33.3	151	27	42	(24)	219	202	7.4	0.0	7.4	0.0	LA Fyn, Søholm
1873	Nybøllegaard	50	3844	116	125	n/a	(104.2)	(19.6)	n/a	124	24	(43)	(24)	187	169	7.7	0.0	7.7	0.0	Jenkins (1882), p. 59
1873	Kjærsgaard	40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	214	23	58	(33)	294	270	4.5	0.0	4.5	0.0	Jenkins (1876), pp. 26-36
1873	Ourupgaard	220	n/a	196	273	n/a	107.2	20.5	n/a	209	56	(40)	23	306	288	9.9	0.0	9.9	0.0	Fenger (1873), pp. 390-91
1873	Søholm	60	4231	137	149	217 <sup>3</sup>	101.2	18.7	41.7 <sup>3</sup>	139	28	67	(38)	234	205	7.6	0.0	7.6	0.0	LA Fyn, Søholm
1874	Søholm	70	5234	161	211	152 <sup>3</sup>	109.0	21.2	40.6 <sup>3</sup>	175	45	45	(26)	265	246	8.9	0.0	8.9	0.0	LA Fyn, Søholm
1875	Søholm	(70)	4569	118	169	93 <sup>3</sup>	125.1	18.1	42.7 <sup>3</sup>	147	31	40	(23)	218	200	8.8	0.0	8.8	0.0	LA Fyn, Søholm
1875	Jylland-D	118	4710	150	166	n/a	131.4	20.3	n/a	197	34	(57)	(33)	288	263	6.6	0.0	6.6	0.0	4:11, pp. 110-113
1876	Sealand-1	71	5093	179	105	n/a	141.0	21.9	n/a	253	23	(60)	(34)	336	310	3.5	0.0	3.5	0.0	4:10, p. 536
1876	Sealand-2	92	5414	195	112	n/a	126.1	23.0	n/a	246	26	(65)	(37)	337	309	3.8	0.0	3.8	0.0	4:10, p. 537
1876	Sealand-3	197	5384	177	159	n/a	125.4	23.0	n/a	222	37	(63)	(36)	322	295	5.6	0.0	5.6	0.0	4:10, p. 537
1876	Sealand-4	45	6657	221	243	n/a	138.7	21.6	n/a	307	52	(79)	(45)	439	405	6.3	0.0	6.3	0.0	4:10, p. 537
1876	Sealand-5	46	3957	117	215	n/a	129.9	31.8	n/a	152	68	(47)	(27)	267	247	9.1	0.0	9.1	0.0	4:10, p. 537
1876	Sealand-6	110	5246	176	182	n/a	125.5	24.3	n/a	221	44	(64)	(36)	329	301	6.3	0.0	6.3	0.0	4:10, p. 537
1876	Sealand-7	125	5357	174	230	n/a	140.7	25.9	n/a	245	60	(64)	(36)	369	341	7.0	0.0	7.0	0.0	4:10, p. 537
1876	Sealand-8	11	9136	294	212	n/a	129.5	29.9	n/a	381	63	(112)	(64)	556	508	4.4	0.0	4.4	0.0	4:10, p. 537
1876	Sealand-9	127	5556	190	22	n/a	127.3	25.0	n/a	241	5	(62)	(35)	309	282	0.8	0.0	0.8	0.0	4:10, p. 537
1876	Sealand-10	71	4394	163	- <sup>5</sup>	n/a	128.6	- <sup>5</sup>	n/a	210	- <sup>5</sup>	(53)	(30)	263	241	0.0	0.0	0.0	0.0	4:10, p. 537
1876	Fyn-1	60	5151	152	111	n/a	119.2	21.7	n/a	182	24	(60)	(34)	266	240	4.8	0.0	4.8	0.0	4:10, pp. 558-559
1876	Fyn-2	107	4687	164	152	n/a	122.0	22.3	n/a	201	34	(57)	(32)	291	267	5.9	0.0	5.9	0.0	4:10, pp. 558-559
1876	Fyn-3	100	4138	130	104	n/a	120.0	25.0	n/a	157	26	(49)	(28)	232	210	5.1	0.0	5.1	0.0	4:10, pp. 558-559
1876	Fyn-4	84	4128	116	83	n/a	123.2	21.0	n/a	143	17	(45)	(26)	206	186	4.7	0.0	4.7	0.0	4:10, pp. 558-559
1876	Fyn-5	47	4214	127	123	n/a	120.0	22.7	n/a	153	28	(49)	(28)	230	209	6.1	0.0	6.1	0.0	4:10, pp. 558-559
1876	Fyn-7	35	4457	156	110	n/a	115.0	23.0	n/a	180	25	(53)	(30)	258	235	4.9	0.0	4.9	0.0	4:10, pp. 558-559
1876	Fyn-9	39	4523	137	86	n/a	118.0	23.0	n/a	162	20	(54)	(31)	236	212	4.2	0.0	4.2	0.0	4:10, pp. 558-559
1876	Fyn-10	108	4550	145	220	n/a	126.9	34.0	n/a	185	75	(54)	(31)	313	290	7.9	0.0	7.9	0.0	4:10, pp. 558-559
1876	Fyn-11	14	5430	162	107	n/a	132.8	28.0	n/a	215	30	(65)	(37)	311	283	4.0	0.0	4.0	0.0	4:10, pp. 558-559
1876	Jylland-A	86	4390	142	179	n/a	134.1	30.0	n/a	190	54	(52)	(30)	296	273	6.8	0.0	6.8	0.0	4:11, pp. 110-113
1876	Jylland-B	105	4330	136	155	n/a	129.6	28.1	n/a	176	44	(51)	(29)	271	249	6.5	0.0	6.5	0.0	4:11, pp. 110-113
1876	Jylland-L	43	4350	138	150	n/a	135.5	35.0	n/a	187	52	(51)	(29)	290	268	5.8	0.0	5.8	0.0	4:11, pp. 110-113
1876	Jylland-M	97	5070	141	158	n/a	136.1	33.7	n/a	202	53	(60)	(34)	316	290	5.7	0.0	5.7	0.0	4:11, pp. 110-113
1876	Jylland-O	80	4535	145	154	n/a	133.1	23.3	n/a	192	36	(52)	(30)	281	258	6.2	0.0	6.2	0.0	4:11, pp. 110-113

1876	Jylland-I	65	3910	119	179	n/a	131.4	27.2	n/a	156	49	(46)	(26)	250	231	8.1	0.0	8.1	0.0	4:11, pp. 110-113
1876	Jylland-N	45	4780	164	109	n/a	(126.6)	(24.4)	n/a	207	27	(58)	(33)	292	267	4.2	0.0	4.2	0.0	4:11, pp. 110-113
1876	Jylland-R	100	4320	147	150	n/a	123.0	25.6	n/a	180	38	(52)	(30)	271	248	6.3	0.0	6.3	0.0	4:11, pp. 110-113
1876	Jylland-H	74	3500	115	54	n/a	120.0	26.6	n/a	138	14	(43)	(24)	195	177	3.2	0.0	3.2	0.0	4:11, pp. 110-113
1876	Jylland-G	80	4370	139	160	n/a	125.0	19.0	n/a	174	30	(53)	(30)	257	234	7.1	0.0	7.1	0.0	4:11, pp. 110-113
1876	Jylland-C	70	4120	142	101	n/a	120.4	20.0	n/a	171	20	(50)	(28)	241	220	4.8	0.0	4.8	0.0	4:11, pp. 110-113
1876	Jylland-E	118	2740	92	60	n/a	125.0	16.3	n/a	116	10	(31)	(18)	157	143	4.4	0.0	4.4	0.0	4:11, pp. 110-113
1876	LolFal-A	140	4097	126	170	n/a	125.0	24.0	n/a	157	41	(48)	(28)	246	226	7.8	0.0	7.8	0.0	4:11, pp. 122-123
1876	LolFal-B	140	4138	138	181	n/a	126.0	20.4	n/a	174	37	(50)	(28)	260	239	7.9	0.0	7.9	0.0	4:11, pp. 122-123
1876	LolFal-C	134	4268	137	157	n/a	(126.6)	22.0	n/a	174	35	(50)	(28)	259	237	6.9	0.0	6.9	0.0	4:11, pp. 122-123
1876	LolFal-E	107	5187	167	218	n/a	124.0	28.0	n/a	207	61	(75)	43	343	311	7.3	0.0	7.3	0.0	4:11, pp. 122-123
1876	LolFal-F	96	4414	140	129	n/a	124.0	(24.4)	n/a	174	32	(53)	(30)	258	236	5.7	0.0	5.7	0.0	4:11, pp. 122-123
1876	LolFal-G	80	4571	143	159	n/a	130.0	(24.4)	n/a	186	39	(53)	(30)	279	256	6.5	0.0	6.5	0.0	4:11, pp. 122-123
1876	LolFal-H	70	4073	128	138	n/a	120.0	23.0	n/a	153	32	(48)	(27)	233	212	6.8	0.0	6.8	0.0	4:11, pp. 122-123
1876	LolFal-J	40	4441	138	- <sup>6</sup>	n/a	119.0	- <sup>6</sup>	n/a	164	- <sup>6</sup>	(53)	(30)	218	195	0.0	0.0	0.0	0.0	4:11, pp. 122-123
1876	LolFal-K	40	3490	111	- <sup>6</sup>	n/a	118.0	- <sup>6</sup>	n/a	131	- <sup>6</sup>	(42)	(24)	173	155	0.0	0.0	0.0	0.0	4:11, pp. 122-123
1876	LolFal-M	17	4803	155	187	n/a	116.2	20.2	n/a	181	38	(57)	(32)	275	251	7.8	0.0	7.8	0.0	4:11, pp. 122-123
1877	Fyn-4	81	4064	115	101	n/a	118.3	24.0	n/a	136	24	(39)	(22)	199	183	5.8	0.0	5.8	0.0	4:12, pp. 76-77
1877	Fyn-6	17	4718	129	82	n/a	120.0	27.1	n/a	154	22	(42)	24	219	200	4.2	0.0	4.2	0.0	4:12, pp. 76-77
1877	Fyn-7	34	4669	165	138	n/a	124.0	25.3	n/a	204	35	(43)	24	282	264	5.5	0.0	5.5	0.0	4:12, pp. 76-77
1877	Fyn-9	38	4100	131	87	n/a	118.7	25.7	n/a	156	22	(34)	19	212	198	4.6	0.0	4.6	0.0	4:12, pp. 76-77
1877	Fyn-5	46	4690	147	150	n/a	125.0	24.5	n/a	184	37	(37)	21	258	242	6.4	0.0	6.4	0.0	4:12, pp. 76-77
1877	Fyn-12	42	4753	144	167	n/a	130.1	32.0	n/a	188	53	(42)	24	283	265	6.6	0.0	6.6	0.0	4:12, pp. 76-77
1877	NYJyll-A	174	5554	163	270	n/a	137.4	25.0	n/a	223	68	(57)	(33)	349	324	8.8	0.0	8.8	0.0	4:12, pp. 84-85
1877	NYJyll-B	24	5660	166	169	n/a	131.9	26.0	n/a	219	27	(56)	(32)	302	278	3.9	0.0	3.9	0.0	4:12, pp. 84-85
1877	NYJyll-C	18	5360	166	242	n/a	130.0	25.0	n/a	216	60	(55)	(31)	331	307	8.2	0.0	8.2	0.0	4:12, pp. 84-85
1877	NYJyll-D	15	4976	157	104	n/a	109.0	32.3	n/a	171	34	(49)	(28)	254	233	4.7	0.0	4.7	0.0	4:12, pp. 84-85
1877	NYJyll-E	16	4880	144	109	n/a	113.3	31.0	n/a	162	34	(51)	(29)	246	224	5.1	0.0	5.1	0.0	4:12, pp. 84-85
1877	NYJyll-F	10	4398	n/a	39	n/a	n/a	(27.4)	n/a	n/a	11	(43)	(25)	54	35	11.6	0.0	11.6	0.0	4:12, pp. 84-85
1877	NYJyll-G	26	5394	192	169	n/a	115.0	27.0	n/a	221	46	(55)	(31)	321	298	5.9	0.0	5.9	0.0	4:12, pp. 84-85
1877	Jylland-1A	83	5130	165	223	n/a	132.8	(27.4)	n/a	221	61	(53)	(30)	336	313	7.4	0.0	7.4	0.0	4:12, pp. 480-583.
1877	Jylland-2B	105	4020	126	149	n/a	128.2	32.5	n/a	168	48	(40)	(23)	257	240	6.5	0.0	6.5	0.0	4:12, pp. 480-583.
1877	Jylland-22	106	4490	139	- <sup>6</sup>	n/a	135.7	- <sup>6</sup>	n/a	189	- <sup>6</sup>	(46)	(26)	234	215	0.0	0.0	0.0	0.0	4:12, pp. 480-583.
1877	Jylland-10J	60	3620	108	168	n/a	127.7	30.0	n/a	147	50	(36)	(20)	233	218	8.0	0.0	8.0	0.0	4:12, pp. 480-583.
1877	Jylland-15O	80	3550	106	105	n/a	135.0	25.0	n/a	150	26	(36)	(20)	212	197	5.6	0.0	5.6	0.0	4:12, pp. 480-583.
1877	Jylland-21	39	3780	117	111	n/a	125.7	20.1	n/a	151	22	(39)	(22)	212	195	5.9	0.0	5.9	0.0	4:12, pp. 480-583.

1877	Jylland-13M	100	4610	138	171	n/a	136.8	37.4	n/a	193	64	(47)	(27)	304	283	6.3	0.0	6.3	0.0	4:12, pp. 480-583.
1877	Jylland-9(I)	77	3400	107	99	n/a	120.0	25.0	n/a	131	25	(35)	(20)	191	175	5.9	0.0	5.9	0.0	4:12, pp. 480-583.
1877	Jylland-8H	124	3540	105	111	n/a	(123.6)	(27.4)	n/a	129	30	(37)	(21)	196	180	6.4	0.0	6.4	0.0	4:12, pp. 480-583.
1877	Jylland-16P	121	4200	129	116	n/a	(123.6)	24.0	n/a	159	28	(44)	(25)	231	212	5.7	0.0	5.7	0.0	4:12, pp. 480-583.
1877	Jylland-19	90	4910	147	253	n/a	127.7	36.9	n/a	196	93	(49)	(28)	339	318	8.3	0.0	8.3	0.0	4:12, pp. 480-583.
1877	Jylland-3C	71	4570	145	170	n/a	117.6	28.5	n/a	172	48	(48)	(27)	268	248	7.1	0.0	7.1	0.0	4:12, pp. 480-583.
1877	Jylland-17	70	3740	125	52	n/a	119.0	(27.4)	n/a	156	14	(37)	(21)	208	192	2.8	0.0	2.8	0.0	4:12, pp. 480-583.
1877	Jylland-5E	116	2980	99	69	n/a	118.7	23.0	n/a	131	16	(28)	(16)	175	163	4.4	0.0	4.4	0.0	4:12, pp. 480-583.
1877	Jylland-6	83	5550	185	174	n/a	125.0	(27.4)	n/a	235	48	(58)	(33)	340	315	5.8	0.0	5.8	0.0	4:12, pp. 480-583.
1877	Jylland-7	70	5080	162	178	n/a	125.4	26.0	n/a	207	46	(53)	(30)	305	283	6.6	0.0	6.6	0.0	4:12, pp. 480-583.
1877	Jylland-11	73	3520	104	102	n/a	112.3	25.0	n/a	121	26	(36)	(20)	182	167	6.4	0.0	6.4	0.0	4:12, pp. 480-583.
1877	Jylland-12	52	3780	116	64	n/a	127.0	27.0	n/a	148	17	(39)	(22)	204	187	3.6	0.0	3.6	0.0	4:12, pp. 480-583.
1877	Jylland-18	100	1880	69	38	n/a	113.5	25.0	n/a	82	10	(19)	(11)	110	102	3.9	0.0	3.9	0.0	4:12, pp. 480-583.
1877	Jylland-23	45	4320	140	147	n/a	111.3	30.0	n/a	156	44	(44)	(25)	244	225	6.8	0.0	6.8	0.0	4:12, pp. 480-583.
1877	Jylland-24 Buske	34	5490	183	133	n/a	123.0	23.0	n/a	230	31	(56)	(32)	317	293	4.7	0.0	4.7	0.0	4:12, pp. 480-583.
1878	Sprittfabrik	(74)	4454	203	129	n/a	(100.2)	(22.7)	n/a	204	29	(44)	(25)	277	258	5.2	0.0	5.2	0.0	EA Århus, Buske
1879	Mejeri-1	115	3550	129	95	180	103.4	17.8	26.3	133	17	47	26	197	176	5.6	0.0	5.6	0.0	4:14, pp. 56-61.
1879	Mejeri-3	107	4300	140	193	164	106.7	20.0	25.4	148	39	42	(26)	229	214	9.4	0.0	9.4	0.0	4:14, pp. 56-61.
1879	Mejeri-5	45	6320	224	142	317	100.8	15.0	28.8	224	21	91	60	336	305	4.8	0.0	4.8	0.0	4:14, pp. 56-61.
1879	Mejeri-6	111	4680	158	147	214	100.0	15.0	28.2	159	22	60	32	242	213	7.2	0.0	7.2	0.0	4:14, pp. 56-61.
1879	Mejeri-7	79	4620	164	149	185	100.3	19.0	28.2	165	28	52	24	245	217	7.1	0.0	7.1	0.0	4:14, pp. 56-61.
1879	Mejeri-8	68	5380	174	110	243	100.5	20.0	29.5	175	22	72	46	269	243	4.7	0.0	4.7	0.0	4:14, pp. 56-61.
1879	Mejeri-9	14	6320	194	219	321	85.0	19.5	25.3	170	43	81	42	294	254	9.0	0.0	9.0	0.0	4:14, pp. 56-61.
1879	Mejeri-12	95	4760	140	94	143	99.4	21.5	26.4	142	20	38	21	199	183	5.3	0.0	5.3	0.0	4:14, pp. 56-61.
1879	Mejeri-13	66	3020	110	73	129	97.3	20.0	27.5	105	15	35	31	155	151	5.0	0.0	5.0	0.0	4:14, pp. 56-61.
1879	Mejeri-14	35	4500	167	47	79	80.5	18.0	27.5	136	8	22	(12)	167	157	3.1	0.0	3.1	0.0	4:14, pp. 56-61.
1879	Mejeri-15	72	5400	176	142	261	107.0	15.5	27.0	188	22	70	27	281	237	6.2	0.0	6.2	0.0	4:14, pp. 56-61.
1879	Mejeri-16	35	4870	172	169	89	86.8	16.0	28.5	150	27	25	(14)	203	192	9.2	0.0	9.2	0.0	4:14, pp. 56-61.
1879	Mejeri-17	32	4430	152	151	151	99.9	19.5	28.1	153	29	43	27	225	210	7.5	0.0	7.5	0.0	4:14, pp. 56-61.
1879	Mejeri-18	70	5020	160	161	188	99.6	21.5	28.8	161	35	54	33	250	229	7.4	0.0	7.4	0.0	4:14, pp. 56-61.
1879	Mejeri-19	100	4580	147	169	263	101.5	20.5	27.3	145	35	72	39	251	219	8.0	0.0	8.0	0.0	4:14, pp. 56-61.
1879	Mejeri-20	68	4680	169	83	153	97.0	21.0	26.5	167	17	41	16	225	201	4.3	0.0	4.3	0.0	4:14, pp. 56-61.
1879	Mejeri-21	63	3960	127	65	94	98.5	21.1	25.7	125	14	24	14	163	152	4.4	0.0	4.4	0.0	4:14, pp. 56-61.
1879	Mejeri-22	74	4800	160	210	194	97.5	16.1	(27.6)	158	34	53	(32)	245	223	9.8	0.0	9.8	0.0	4:14, pp. 56-61.
1879	Mejeri-24	42	3900	138	- <sup>6</sup>	64	93.6	- <sup>6</sup>	30.5	130	- <sup>6</sup>	19	(11)	149	141	0.0	0.0	0.0	0.0	4:14, pp. 56-61.
1879	Mejeri-25	150	4820	163	77	230	115.5	18.0	31.5	192	14	72	59	279	265	3.0	0.0	3.0	0.0	4:14, pp. 56-61.

1879	Mejeri-26	69	3880	125	175	144	108.6	23.0	27.5	136	40	40	24	216	200	9.1	0.0	9.1	0.0	4:14, pp. 56-61.
1879	Mejeri-27	116	4420	141	130	190	104.5	17.3	26.1	156	22	50	29	228	207	6.6	0.0	6.6	0.0	4:14, pp. 56-61.
1880	Nybøllegaard	46	5763	183	170	n/a	(108.1)	(21.3)	n/a	197	36	n/a	(39)	n/a	273	6.5	0.0	6.5	0.0	Jenkins (1882), p. 59
1880	Engelsholm	(107.5)	4641	139	186	n/a	(116.3)	(21.3)	n/a	162	39	n/a	(32)	n/a	233	8.3	0.0	8.3	0.0	Jenkins (1882), p. 59
1880	Sanderumgaard	108	4854	176	176	n/a	(116.3)	(21.3)	n/a	204	37	n/a	15 <sup>7</sup>	n/a	257	7.1	0.0	7.1	0.0	Jenkins (1882), p. 29
1880	Lykkenssæde	35	4803	162	171	n/a	(116.3)	(21.3)	n/a	189	36	n/a	(33)	n/a	258	6.9	0.0	6.9	0.0	Jenkins (1882), p. 30
1880	Basnæs	133	4385	135	153	158	121.6	21.0	36.1	164	31	57	23	252	218	7.0	0.0	7.0	0.0	LA Sjælland, Basnæs
1880	Mejeri-1	116	3320	124	130	140	120.1	18.5	33.0	149	21	46	28	216	197	5.9	0.0	5.9	0.0	4:15, pp. 46-57.
1880	Mejeri-6	110	4050	144	104	248	116.7	20.8	34.2	174	17	83	53	274	245	3.5	0.0	3.5	0.0	4:15, pp. 46-57.
1880	Mejeri-7	78	4130	145	155	245	119.8	21.8	34.5	171	28	85	42	284	241	5.6	0.0	5.6	0.0	4:15, pp. 46-57.
1880	Mejeri-8	68	300	146	167	153	116.5	20.5	36.9	170	28	56	35	254	233	6.1	0.0	6.1	0.0	4:15, pp. 46-57.
1880	Mejeri-11	31	3820	129	83	38	104.8	27.5	35.5	134	23	14	12	171	169	5.1	0.0	5.1	0.0	4:15, pp. 46-57.
1880	Mejeri-12	92	4000	136	20	158	115.0	23.0	32.8	156	4	49	32	209	191	0.9	0.0	0.9	0.0	4:15, pp. 46-57.
1880	Mejeri-13	70	3130	111	74	122	118.0	22.5	30.5	130	15	38	29	183	174	3.9	0.0	3.9	0.0	4:15, pp. 46-57.
1880	Mejeri-15	92	4560	146	139	217	121.5	18.2	(35.8)	177	25	78	50	280	253	5.7	0.0	5.7	0.0	4:15, pp. 46-57.
1880	Mejeri-16	34	4950	172	177	215	114.0	16.0	(31.8)	192	35	68	33	296	261	8.7	0.0	8.7	0.0	4:15, pp. 46-57.
1880	Mejeri-18	70	4930	172	130	77	114.5	21.0	32.5	198	21	34	29	253	248	4.3	0.0	4.3	0.0	4:15, pp. 46-57.
1880	Mejeri-20	70	4040	142	49	167	116.1	22.0	33.0	166	9	58	36	233	211	2.0	0.0	2.0	0.0	4:15, pp. 46-57.
1880	Mejeri-21	59	3760	126	104	82 <sup>3</sup>	120.5	23.0	44.3 <sup>3</sup>	153	19	49	33	222	205	4.3	0.0	4.3	0.0	4:15, pp. 46-57.
1880	Mejeri-22	80	4680	158	259	212	114.0	19.3	30.0	182	51	78	44	311	277	9.9	0.0	9.9	0.0	4:15, pp. 46-57.
1880	Mejeri-24	35	3880	144	42	109	114.5	24.5	32.5	166	8	59	48	234	223	1.6	0.0	1.6	0.0	4:15, pp. 46-57.
1880	Mejeri-25	142	4960	180	175	221	118.1	19.5	34.0	215	29	83	53	326	297	5.1	0.0	5.1	0.0	4:15, pp. 46-57.
1880	Mejeri-26	69	3570	118	126	159	119.6	23.5	33.0	141	24	52	31	218	197	5.5	0.0	5.5	0.0	4:15, pp. 46-57.
1880	Mejeri-27	117	4130	130	115	172	117.0	22.4	32.7	154	21	60	41	235	216	4.5	0.0	4.5	0.0	4:15, pp. 46-57.
1880	Mejeri-29	52	4080	135	131	124	114.9	20.0	34.0	154	20	47	33	222	208	5.1	0.0	5.1	0.0	4:15, pp. 46-57.
1881	Basnæs	132	4279	146	146	120	116.1	19.1	37.6	169	28	45	17	242	214	7.1	0.0	7.1	0.0	LA Sjælland, Basnæs
1881	Mejeri-1	125	3393	110	121	129	117.1	21.0	33.8	129	25	43	27	198	181	6.9	0.0	6.9	0.0	5:1, pp. 56-73
1881	Mejeri-2	112	4161	138	165	228	111.8	24.6	33.5	156	34	77	45	267	234	6.1	0.0	6.1	0.0	5:1, pp. 56-73
1881	Mejeri-3	110	4085	139	114	266	117.5	24.0	34.9	166	22	92	57	280	246	4.0	0.0	4.0	0.0	5:1, pp. 56-73
1881	Mejeri-4	79	4098	135	159	211	119.3	25.0	34.0	161	33	70	33	264	226	6.0	0.0	6.0	0.0	5:1, pp. 56-73
1881	Mejeri-5	70	4159	141	134	215	115.5	24.0	36.0	164	26	76	33	267	223	5.1	0.0	5.1	0.0	5:1, pp. 56-73
1881	Mejeri-6	31	3446	112	73	142	108.5	28.4	32.6	122	17	45	24	184	163	3.8	0.0	3.8	0.0	5:1, pp. 56-73
1881	Mejeri-7	72	3237	111	38	109	117.1	20.0	31.0	131	6	34	27	172	165	2.0	0.0	2.0	0.0	5:1, pp. 56-73
1881	Mejeri-9	37	4064	140	147	774	109.9	22.0	34.3	154	29	26	10	209	193	7.0	0.0	7.0	0.0	5:1, pp. 56-73
1881	Mejeri-10	62	5038	182	213	167	120.0	25.0	35.0	223	44	60	52	327	319	5.7	0.0	5.7	0.0	5:1, pp. 56-73
1881	Mejeri-11	70	4128	136	141	129	117.5	24.0	35.0	160	28	45	15	233	203	5.9	0.0	5.9	0.0	5:1, pp. 56-73

1881	Mejeri-12	56	3778	134	98	120 <sup>3</sup>	122.0	25.0	42.0 <sup>3</sup>	164	20	57	33	242	218	3.9	0.0	3.9	0.0	5:1, pp. 56-73
1881	Mejeri-13	90	4575	143	231	214	115.5	24.9	32.5	166	47	73	33	286	246	8.0	0.0	8.0	0.0	5:1, pp. 56-73
1881	Mejeri-14	37	4144	154	36	105	112.1	23.5	33.3	173	7	41	25	221	205	1.5	0.0	1.5	0.0	5:1, pp. 56-73
1881	Mejeri-15	143	4325	150	167	205	117.0	25.0	35.5	176	34	71	28	281	238	6.0	0.0	6.0	0.0	5:1, pp. 56-73
1881	Mejeri-16	61	3838	127	161	180	115.9	25.0	34.5	147	33	66	36	246	216	6.3	0.0	6.3	0.0	5:1, pp. 56-73
1881	Mejeri-17	119	4293	149	128	157	118.8	24.0	33.6	180	25	52	31	257	236	4.6	0.0	4.6	0.0	5:1, pp. 56-73
1881	Mejeri-18	80	3977	139	192	168	126.8	22.0	34.0	166	35	57	(33)	257	233	7.0	0.0	7.0	0.0	5:1, pp. 56-73
1881	Mejeri-19	44	5055	182	121	166	113.4	24.5	38.8	205	23	64	42	292	270	3.6	0.0	3.6	0.0	5:1, pp. 56-73
1881	Mejeri-20	85	4835	174	171	255	113.5	22.5	36.5	198	32	92	53	321	283	5.2	0.0	5.2	0.0	5:1, pp. 56-73
1881	Mejeri-21	115	41782	137	157	117 <sup>3</sup>	129.0	31.0	44.6 <sup>3</sup>	176	40	39	27	255	243	5.5	0.0	5.5	0.0	5:1, pp. 56-73
1881	Mejeri-22	19	5609	180	206	256	114.1	26.5	33.0	206	45	82	22	333	273	6.4	0.0	6.4	0.0	5:1, pp. 56-73
1881	Mejeri-24	65	5080	168	221	166	121.0	25.5	33.0	207	46	55	29	308	283	6.7	0.0	6.7	0.0	5:1, pp. 56-73
1882	Basnæs	129	4406	149	147	175	116.7	24.8	36.9	172	29	62	26	263	227	5.3	0.0	5.3	0.0	LA Sjøælland, Basnæs
1882	Mejeri-1	106	4037	124	115	273	118.9	24.5	33.6	144	23	92	40	259	207	4.7	0.0	4.7	0.0	5:2, pp. 38-49
1882	Mejeri-2	80	3968	130	125	176	112.0	23.8	33.8	144	24	60	15	228	183	5.8	0.0	5.8	0.0	5:2, pp. 38-49
1882	Mejeri-3	65.5	4196	140	206	188	122.8	23.5	34.0	172	40	64	36	276	248	7.1	0.0	7.1	0.0	5:2, pp. 38-49
1882	Mejeri-4	29	4225	126	132	159	108.3	23.9	31.8	133	26	65	22	223	180	6.3	0.0	6.3	0.0	5:2, pp. 38-49
1882	Mejeri-5	35.5	4645	151	167	200	111.0	20.3	32.2	167	32	67	23	266	222	7.4	0.0	7.4	0.0	5:2, pp. 38-49
1882	Mejeri-6	62.5	4044	127	108	162	121.5	28.0	33.0	153	25	66	19	243	196	4.7	0.0	4.7	0.0	5:2, pp. 38-49
1882	Mejeri-7	55.5	4204	147	135	114 <sup>3</sup>	123.0	25.0	44.5 <sup>3</sup>	179	28	64	42	271	249	4.6	0.0	4.6	0.0	5:2, pp. 38-49
1882	Mejeri-8	81	4883	148	190	203	116.6	19.2	32.1	174	34	70	23	278	231	8.0	0.0	8.0	0.0	5:2, pp. 38-49
1882	Mejeri-9	31.5	4767	163	16	51	120.0	25.0	35.0	196	3	43	29	242	227	0.6	0.0	0.6	0.0	5:2, pp. 38-49
1882	Mejeri-10	65	3936	120	172	186	116.0	25.0	32.4	137	35	63	24	236	196	7.5	0.0	7.5	0.0	5:2, pp. 38-49
1882	Mejeri-11	113	4469	140	145	186	118.1	22.5	32.2	167	27	64	39	257	232	5.3	0.0	5.3	0.0	5:2, pp. 38-49
1882	Mejeri-12	102	4428	148	192	150 <sup>3</sup>	120.3	32.0	44.3 <sup>3</sup>	177	50	68	39	295	266	6.2	0.0	6.2	0.0	5:2, pp. 38-49
1882	Mejeri-13	17	5808	190	137	259	112.3	26.5	33.0	213	30	85	41	328	283	4.1	0.0	4.1	0.0	5:2, pp. 38-49
1882	Mejeri-15	29.5	5553	167	106	117	113.0	27.5	31.7	192	24	41	24	257	240	3.8	0.0	3.8	0.0	5:2, pp. 38-49
1882	Mejeri-16	112.5	4334	138	235	193	116.8	24.8	32.0	158	48	62	26	267	232	8.7	0.0	8.7	0.0	5:2, pp. 38-49
1882	Mejeri-17	24.5	5749	171	179	98	108.0	25.0	33.0	186	37	32	18	255	240	6.3	0.0	6.3	0.0	5:2, pp. 38-49
1882	Mejeri-18	175	4790	156	229	165	121.0	25.0	36.0	186	47	59	33	293	267	7.3	0.0	7.3	0.0	5:2, pp. 38-49
1882	Mejeri-19	54.5	5578	191	199	232	114.7	19.0	33.5	224	31	78	36	332	290	5.9	0.0	5.9	0.0	5:2, pp. 38-49
1882	Mejeri-20	7	4987	164	151	237	113.0	17.7	34.5	185	22	81	39	288	246	5.3	0.0	5.3	0.0	5:2, pp. 38-49
1882	Mejeri-21	87	4585	160	208	179	119.1	25.0	32.2	189	53	61	34	302	275	8.0	0.0	8.0	0.0	5:2, pp. 38-49
1882	Mejeri-22	48	4612	153	90	151	115.2	23.5	32.6	174	17	66	38	258	230	3.3	0.0	3.3	0.0	5:2, pp. 38-49
1882	Mejeri-23	174	3351	107	144	168	117.9	18.0	33.3	123	21	59	28	203	172	7.2	0.0	7.2	0.0	5:2, pp. 38-49
1882	Mejeri-24	176	5353	182	149	190	108.8	21.0	35.0	197	26	67	19	289	241	5.3	0.0	5.3	0.0	5:2, pp. 38-49

1882	Mejeri-25	114	4508	160	141	177	118.3	20.5	35.0	188	29	62	20	279	237	6.2	0.0	6.2	0.0	5:2, pp. 38-49
1882	Mejeri-26	45.5	4813	172	179	228	125.0	22.3	36.3	214	33	83	33	329	279	5.5	0.0	5.5	0.0	5:2, pp. 38-49
1882	Mejeri-27	67.5	5850	204	202	467	114.0	21.9	34.5	231	36	161	53	429	320	5.4	0.0	5.4	0.0	5:2, pp. 38-49
1883	Basnæs	133	4373	152	49	194	113.3	15.4	34.7	172	15	67	25	253	211	4.7	0.0	4.7	0.0	LA Sjælland, Basnæs
1883	Mejeri-2	79	4493	151	163	217	113.3	21.0	33.0	171	28	72	28	271	228	6.1	0.0	6.1	0.0	5:3, pp. 30-47
1883	Mejeri-3	67	4508	162	216	248	109.6	22.0	32.4	179	39	85	35	303	253	7.3	0.0	7.3	0.0	5:3, pp. 30-47
1883	Mejeri-4	29	3765	133	50	141	105.0	26.1	32.7	140	11	46	20	197	171	2.5	0.0	2.5	0.0	5:3, pp. 30-47
1883	Mejeri-5	34.5	4879	166	193	203	106.9	18.6	30.9	178	29	70	26	278	234	7.1	0.0	7.1	0.0	5:3, pp. 30-47
1883	Mejeri-6	70	4648	159	110	180	127.5	20.0	33.0	207	18	71	34	297	260	3.6	0.0	3.6	0.0	5:3, pp. 30-47
1883	Mejeri-7	61	3879	142	99	114 <sup>3</sup>	119.0	22.3	44.0 <sup>3</sup>	170	18	66	47	253	234	3.6	0.0	3.6	0.0	5:3, pp. 30-47
1883	Mejeri-8	79.5	5321	188	192	114	113.0	16.1	33.0	216	25	49	25	291	266	6.2	0.0	6.2	0.0	5:3, pp. 30-47
1883	Mejeri-9	40	5572	200	65	144	112.8	25.0	31.0	229	13	45	21	287	264	2.1	0.0	2.1	0.0	5:3, pp. 30-47
1883	Mejeri-10	76	4189	133	170	195	111.9	24.0	31.8	149	34	71	31	253	213	6.8	0.0	6.8	0.0	5:3, pp. 30-47
1883	Mejeri-11	109.5	4351	139	121	206	108.0	22.6	31.6	152	22	69	33	243	207	5.0	0.0	5.0	0.0	5:3, pp. 30-47
1883	Mejeri-12	122	4806	167	243	160	109.3	25.0	33.3	182	50	55	23	287	255	8.1	0.0	8.1	0.0	5:3, pp. 30-47
1883	Mejeri-13	16	5686	198	14	494	108.2	19.9	31.5	215	3	157	51	374	269	0.6	0.0	0.6	0.0	5:3, pp. 30-47
1883	Mejeri-14	75	5177	175	191	144	110.1	25.5	33.2	194	40	48	27	282	261	6.2	0.0	6.2	0.0	5:3, pp. 30-47
1883	Mejeri-15	30	5282	162	58	86	107.8	25.0	32.5	179	12	27	20	218	211	2.4	0.0	2.4	0.0	5:3, pp. 30-47
1883	Mejeri-16	121	4241	145	212	210	111.1	22.8	32.3	161	40	68	35	268	236	7.7	0.0	7.7	0.0	5:3, pp. 30-47
1883	Mejeri-17	22.5	5059	152	161	151	99.5	20.0	33.0	153	32	50	24	235	209	8.0	0.0	8.0	0.0	5:3, pp. 30-47
1883	Mejeri-18	46	4796	181	15	497	117.5	16.4	35.5	214	2	177	76	393	292	0.5	0.0	0.5	0.0	5:3, pp. 30-47
1883	Mejeri-19	136.5	3974	146	19	198	114.2	20.0	32.5	170	4	65	23	238	197	1.0	0.0	1.0	0.0	5:3, pp. 30-47
1883	Mejeri-20	182.5	5248	188	138	244	110.5	20.0	34.5	212	23	85	24	319	259	4.6	0.0	4.6	0.0	5:3, pp. 30-47
1883	Mejeri-21	93	5054	188	225	210	111.3	20.0	31.3	209	37	66	36	312	282	6.8	0.0	6.8	0.0	5:3, pp. 30-47
1883	Mejeri-22	51	4792	161	66	158	108.9	20.5	38.8	174	11	61	37	246	221	2.4	0.0	2.4	0.0	5:3, pp. 30-47
1883	Mejeri-23	177	3892	145	155	173	114.2	16.0	32.0	165	20	57	25	243	211	6.3	0.0	6.3	0.0	5:3, pp. 30-47
1884	Basnæs	117	3907	133	69	260	112.0	13.9	29.1	149	10	72	15	230	173	4.2	0.0	4.2	0.0	LA Sjælland, Basnæs
1884	Mejeri-1	107	4037	136	152	240	104.9	20.0	26.8	145	30	68	32	243	207	7.6	0.0	7.6	0.0	5:4, pp. 40-57
1884	Mejeri-2	79	4497	147	125	250	108.0	22.0	27.9	157	22	73	24	252	203	5.1	0.0	5.1	0.0	5:4, pp. 40-57
1884	Mejeri-3	71	3862	147	19	365	107.3	20.0	29.5	161	4	108	51	272	216	0.9	0.0	0.9	0.0	5:4, pp. 40-57
1884	Mejeri-4	28	4119	133	42	270	101.5	27.2	31.5	137	10	85	49	232	195	2.0	0.0	2.0	0.0	5:4, pp. 40-57
1884	Mejeri-5	35.5	4719	164	178	227	102.4	18.4	29.1	170	27	69	14	266	210	7.2	0.0	7.2	0.0	5:4, pp. 40-57
1884	Mejeri-6	66	4198	133	109	150	115.0	22.0	29.0	152	20	53	26	225	198	4.7	0.0	4.7	0.0	5:4, pp. 40-57
1884	Mejeri-7	60.5	4737	176	105	136 <sup>3</sup>	113.0	22.0	36.0 <sup>3</sup>	199	19	56	31	274	248	3.6	0.0	3.6	0.0	5:4, pp. 40-57
1884	Mejeri-8	81	5555	188	160	196	111.5	15.0	27.0	205	18	53	17	276	240	5.3	0.0	5.3	0.0	5:4, pp. 40-57
1884	Mejeri-9	45	5602	158	51	183	112.5	25.0	25.0	179	10	56	30	245	220	2.0	0.0	2.0	0.0	5:4, pp. 40-57

1884	Mejeri-10	69.5	4059	125	157	197	109.0	23.3	28.1	137	30	60	10	227	177	7.6	0.0	7.6	0.0	5:4, pp. 40-57
1884	Mejeri-11	109	4111	127	109	237	108.5	24.1	27.6	140	19	68	27	227	186	4.4	0.0	4.4	0.0	5:4, pp. 40-57
1884	Mejeri-12	112.5	4815	158	205	127	113.7	27.3	27.3	179	46	35	-2	261	223	7.9	0.0	7.9	0.0	5:4, pp. 40-57
1884	Mejeri-13	182	4246	146	247	266	110.0	20.0	30.0	160	40	80	43	280	243	8.7	0.0	8.7	0.0	5:4, pp. 40-57
1884	Mejeri-14	75	5069	1427	149	107	108.6	25.4	26.3	154	31	28	4	213	189	6.7	0.0	6.7	0.0	5:4, pp. 40-57
1884	Mejeri-15	34	4742	147	106	161	108.4	22.5	27.3	160	19	44	31	223	210	4.2	0.0	4.2	0.0	5:4, pp. 40-57
1884	Mejeri-16	106	4294	152	142	258	109.4	20.9	28.7	168	24	74	33	266	226	5.3	0.0	5.3	0.0	5:4, pp. 40-57
1884	Mejeri-17	28.5	5771	165	204	175	101.5	18.0	26.5	167	37	46	15	250	219	9.7	0.0	9.7	0.0	5:4, pp. 40-57
1884	Mejeri-18	49	5335	196	90	403	118.4	18.0	27.2	233	13	110	51	357	297	2.6	0.0	2.6	0.0	5:4, pp. 40-57
1884	Mejeri-19	25	5289	173	57	222	99.6	46.4	28.0	179	26	62	41	268	247	2.4	0.0	2.4	0.0	5:4, pp. 40-57
1884	Mejeri-20	178.5	5709	201	124	261	108.2	20.0	30.9	223	20	80	17	324	261	4.1	0.0	4.1	0.0	5:4, pp. 40-57
1884	Mejeri-21	91.5	4876	191	134	242	110.2	17.0	27.9	210	19	68	29	296	258	4.4	0.0	4.4	0.0	5:4, pp. 40-57
1884	Mejeri-22	50	5279	175	115	198	105.9	18.8	31.3	186	18	73	32	277	235	4.2	0.0	4.2	0.0	5:4, pp. 40-57
1884	Mejeri-23	175	3528	125	89	215	112.6	16.5	27.5	140	13	64	22	217	175	4.7	0.0	4.7	0.0	5:4, pp. 40-57
1884	Mejeri-24	158.5	4837	178	208	225	114.3	23.0	28.0	205	39	65	25	309	269	6.6	0.0	6.6	0.0	5:4, pp. 40-57
1885	Basnæs	143	3870	135	76	156	102.5	12.2	31.1	144	9	48	22	202	176	4.5	0.0	4.5	0.0	LA Sjøelland, Basnæs
1885	Mejeri-1	109	4345	143	180	236	100.8	18.0	28.5	144	24	68	40	237	208	6.7	0.0	6.7	0.0	5:5, pp. 52-66
1885	Mejeri-2	77	4535	151	144	275	100.4	20.3	29.4	151	24	74	19	249	193	6.3	0.0	6.3	0.0	5:5, pp. 52-66
1885	Mejeri-3	62.5	4464	160	127	148	97.3	16.0	30.5	156	16	46	16	218	188	5.6	0.0	5.6	0.0	5:5, pp. 52-66
1885	Mejeri-4	27.5	4571	145	25	118	94.1	24.0	29.0	137	5	36	27	178	169	1.2	0.0	1.2	0.0	5:5, pp. 52-66
1885	Mejeri-5	37	4725	161	160	172	99.2	16.7	28.9	163	21	50	17	234	201	6.6	0.0	6.6	0.0	5:5, pp. 52-66
1885	Mejeri-6	65	3921	123	75	226	110.0	22.0	29.5	136	13	75	37	224	186	3.4	0.0	3.4	0.0	5:5, pp. 52-66
1885	Mejeri-7	61.5	4638	177	118	165	105.5	20.0	25.9	188	19	57	27	264	234	4.3	0.0	4.3	0.0	5:5, pp. 52-66
1885	Mejeri-8	83	5487	189	150	132	103.6	16.0	29.3	195	19	47	23	261	237	5.3	0.0	5.3	0.0	5:5, pp. 52-66
1885	Mejeri-9	41.5	5796	187	61	181	102.1	25.0	26.0	196	6	59	37	261	238	1.0	0.0	1.0	0.0	5:5, pp. 52-66
1885	Mejeri-10	66	4393	134	166	214	100.1	22.0	27.4	133	29	67	26	229	188	7.4	0.0	7.4	0.0	5:5, pp. 52-66
1885	Mejeri-11	154.5	5418	189	247	156	102.0	18.7	30.3	195	34	47	21	276	250	7.5	0.0	7.5	0.0	5:5, pp. 52-66
1885	Mejeri-12	117	5185	189	214	151	105.4	22.0	28.0	198	38	45	17	281	252	7.1	0.0	7.1	0.0	5:5, pp. 52-66
1885	Mejeri-13	50	4989	177	155	226	96.3	17.9	28.8	170	22	66	28	259	221	5.9	0.0	5.9	0.0	5:5, pp. 52-66
1885	Mejeri-14	80.5	4958	149	195	120	100.5	27.0	29.0	149	44	37	11	230	204	8.3	0.0	8.3	0.0	5:5, pp. 52-66
1885	Mejeri-15	157	4799	175	259	219	107.2	19.3	30.0	187	40	67	45	294	272	7.9	0.0	7.9	0.0	5:5, pp. 52-66
1885	Mejeri-16	77.5	3917	136	162	180	97.9	19.5	29.0	135	25	56	34	216	195	6.9	0.0	6.9	0.0	5:5, pp. 52-66
1885	Mejeri-17	32.5	5927	160	235	238	100.0	17.0	26.2	162	34	62	40	259	237	8.8	0.0	8.8	0.0	5:5, pp. 52-66
1885	Mejeri-18	54.5	5211	192	111	423	110.4	14.5	30.3	212	13	128	31	354	257	3.7	0.0	3.7	0.0	5:5, pp. 52-66
1885	Mejeri-19	26.5	6039	195	93	182	92.0	(19.4)	29.0	186	18	55	37	259	240	4.0	0.0	4.0	0.0	5:5, pp. 52-66
1885	Mejeri-20	105	3909	131	106	312	103.0	13.0	29.2	136	11	92	34	239	181	4.9	0.0	4.9	0.0	5:5, pp. 52-66

1885	Mejeri-21	90.5	4892	190	159	222	102.8	15.0	27.6	195	19	63	35	278	249	5.3	0.0	5.3	0.0	5:5, pp. 52-66
1885	Mejeri-22	63	3197	107	79	64	101.2	25.0	28.0	106	17	22	13	145	136	5.1	0.0	5.1	0.0	5:5, pp. 52-66
1886	Basnæs	142	4151	145	63	171	94.4	10.9	24.1	135	7	41	23	184	165	4.0	0.0	4.0	0.0	LA Sjælland, Basnæs
1886	Mejeri-1	108.5	4363	138	77	226	90.2	17.5	27.2	127	12	63	37	202	176	4.1	0.0	4.1	0.0	5:6, pp. 56-79
1886	Mejeri-2	78	4833	169	130	222	92.5	17.0	27.8	157	20	63	33	239	209	5.8	0.0	5.8	0.0	5:6, pp. 56-79
1886	Mejeri-3	176.5	5341	198	131	170	101.0	15.0	27.5	201	16	46	14	263	231	4.7	0.0	4.7	0.0	5:6, pp. 56-79
1886	Mejeri-4	75	4842	174	118	n/a	95.9	11.5	n/a	169	12	54 <sup>8</sup>	43	235	224	4.9	0.0	4.9	0.0	5:6, pp. 56-79
1886	Mejeri-5	38	4899	173	182	120	89.1	13.0	27.5	156	21	33	13	211	191	9.0	0.0	9.0	0.0	5:6, pp. 56-79
1886	Mejeri-6	68	4384	142	36	214	100.0	20.0	29.0	145	6	68	34	219	185	1.8	0.0	1.8	0.0	5:6, pp. 56-79
1886	Mejeri-7	111.5	4729	140	80	236	91.6	15.1	28.1	129	11	68	44	208	184	4.1	0.0	4.1	0.0	5:6, pp. 56-79
1886	Mejeri-8	81	5393	192	45	n/a	96.5	11.0	n/a	187	5	41	15	233	207	2.3	0.0	2.3	0.0	5:6, pp. 56-79
1886	Mejeri-9	43	5929	184	26	152	93.4	23.0	25.0	175	5	44	29	224	209	1.1	0.0	1.1	0.0	5:6, pp. 56-79
1886	Mejeri-10	65	4367	128	160	126	92.0	21.0	28.0	117	27	41	17	185	162	8.2	0.0	8.2	0.0	5:6, pp. 56-79
1886	Mejeri-11	151.5	4997	178	118	148	97.5	12.5	26.3	175	12	39	20	226	207	4.7	0.0	4.7	0.0	5:6, pp. 56-79
1886	Mejeri-12	74	5815	224	4	318	90.3	12.5	28.7	171	1	92	38	264	209	0.2	0.0	0.2	0.0	5:6, pp. 56-79
1886	Mejeri-13	23	7754	288	- <sup>6</sup>	n/a	96.0	- <sup>6</sup>	31.0	280	- <sup>6</sup>	158	67	438	347	0.0	0.0	0.0	0.0	5:6, pp. 56-79
1886	Mejeri-14	93	4345	155	37	n/a	93.9	9.7	n/a	146	4	58	27	208	176	2.2	0.0	2.2	0.0	5:6, pp. 56-79
1886	Mejeri-15	145	4288	164	199	81	99.9	16.5	27.3	163	31	32	14	227	208	9.4	0.0	9.4	0.0	5:6, pp. 56-79
1886	Mejeri-16	78	3640	122	141	118	88.9	16.0	28.0	108	20	36	13	165	142	9.3	0.0	9.3	0.0	5:6, pp. 56-79
1886	Mejeri-17	29	6668	183	183	125	97.0	16.0	25.5	178	26	33	23	237	228	7.5	0.0	7.5	0.0	5:6, pp. 56-79
1886	Mejeri-18	51	5010	184	120	318	105.0	12.8	27.1	192	12	86	62	290	265	3.8	0.0	3.8	0.0	5:6, pp. 56-79
1886	Mejeri-20	89.5	4583	179	52	161	95.3	10.8	27.5	171	6	44	24	221	201	2.7	0.0	2.7	0.0	5:6, pp. 56-79
1887	Basnæs	126	4690	165	180	136	96.0	11.3	24.0	158	20	49	24	228	203	9.3	0.0	9.3	0.0	LA Sjælland, Basnæs
1887	Mejeri-1	106.5	5150	171	162	308	97.2	16.0	26.0	167	23	84	39	275	230	6.6	0.0	6.6	0.0	5:7, pp. 72-96
1887	Mejeri-2	79	4521	155	163	255	96.7	16.0	26.3	149	24	29	42	202	215	7.1	0.0	7.1	0.0	5:7, pp. 72-96
1887	Mejeri-3	177.5	5939	201	194	280	95.9	14.0	26.5	203	25	74	35	302	262	7.0	0.0	7.0	0.0	5:7, pp. 72-96
1887	Mejeri-4	65.5	4472	165	177	234	94.5	15.0	28.0	156	24	66	26	245	206	8.1	0.0	8.1	0.0	5:7, pp. 72-96
1887	Mejeri-5	37.9	4735	166	189	146	94.9	15.9	25.8	158	27	45	23	230	208	8.5	0.0	8.5	0.0	5:7, pp. 72-96
1887	Mejeri-6	71.5	4349	148	70	168	100.5	20.0	27.0	152	13	53	23	219	189	3.7	0.0	3.7	0.0	5:7, pp. 72-96
1887	Mejeri-7	105	4199	129	85	184	94.9	13.6	27.7	123	12	53	19	187	154	5.8	0.0	5.8	0.0	5:7, pp. 72-96
1887	Mejeri-8	63	5658	n/a	128	n/a	n/a	8.9	n/a	211	11	67	18	283	240	5.5	0.0	5.5	0.0	5:7, pp. 72-96
1887	Mejeri-9	45	5443	175	37	132	96.6	25.0	25.0	170	8	40	26	217	204	1.5	0.0	1.5	0.0	5:7, pp. 72-96
1887	Mejeri-10	65	4158	114	151	188	96.1	21.0	26.4	109	28	54	24	191	161	8.5	0.0	8.5	0.0	5:7, pp. 72-96
1887	Mejeri-11	88.5	4486	152	154	208	94.7	17.5	26.0	145	24	54	26	223	195	7.3	0.0	7.3	0.0	5:7, pp. 72-96
1887	Mejeri-12	160	3992	141	94	188	99.4	15.0	26.7	140	13	51	31	203	183	4.8	0.0	4.8	0.0	5:7, pp. 72-96
1887	Mejeri-13	141	5232	204	167	218	97.4	12.0	27.8	199	18	61	27	277	244	6.4	0.0	6.4	0.0	5:7, pp. 72-96



1887	Mejeri-14	102	4195	154	112	170	95.4	12.5	24.5	148	15	42	16	205	179	7.0	0.0	7.0	0.0	5:7, pp. 72-96
1887	Mejeri-15	135	4673	180	198	218	99.8	16.1	26.0	180	29	62	29	271	238	7.8	0.0	7.8	0.0	5:7, pp. 72-96
1887	Mejeri-16	77	3963	131	198	156	92.6	17.3	26.8	121	31	44	19	196	170	10.9	0.0	10.9	0.0	5:7, pp. 72-96
1887	Mejeri-17	36	6175	120	74	96	95.6	25.0	24.5	171	17	24	14	211	201	3.5	0.0	3.5	0.0	5:7, pp. 72-96
1887	Mejeri-18	63	3978	130	63	200	103.0	20.0	27.0	136	13	61	47	210	196	3.6	0.0	3.6	0.0	5:7, pp. 72-96
1887	Mejeri-19	36	4997	160	69	n/a	91.8	13.5	n/a	157	9	35	25	201	192	3.7	0.0	3.7	0.0	5:7, pp. 72-96
1887	Mejeri-20	103	4417	135	101	208	101.0	18.0	26.7	137	15	56	31	207	183	4.6	0.0	4.6	0.0	5:7, pp. 72-96
1887	Mejeri-21	151.5	3848	136	55	152	100.0	15.0	25.5	136	8	42	18	185	162	3.2	0.0	3.2	0.0	5:7, pp. 72-96
1887	Mejeri-22	25	7809	286	- <sup>6</sup>	n/a	96.5	- <sup>6</sup>	n/a	280	- <sup>6</sup>	153	58	433	338	0.0	0.0	0.0	0.0	5:7, pp. 72-96
1887	Mejeri-23	50	4763	168	77	254	103.3	14.0	24.4	172	10	67	28	250	211	3.5	0.0	3.5	0.0	5:7, pp. 72-96
1888	Mejeri-1	114	4700	150	101	277	91.7	16.0	24.4	138	15	69	34	222	187	5.1	0.0	5.1	0.0	5:8, pp. 64-84
1888	Mejeri-2	78	5100	180	205	209	92.5	16.0	23.5	167	30	50	24	246	220	8.8	0.0	8.8	0.0	5:8, pp. 64-84
1888	Mejeri-3	193.5	5424	204	118	131	92.5	15.0	21.2	188	16	27	2	230	205	5.4	0.0	5.4	0.0	5:8, pp. 64-84
1888	Mejeri-4	141	5007	156	239	153	91.5	16.0	24.0	143	34	40	22	218	200	11.2	0.0	11.2	0.0	5:8, pp. 64-84
1888	Mejeri-5	37.1	5125	170	205	200	90.0	15.3	22.3	154	28	46	25	228	207	9.3	0.0	9.3	0.0	5:8, pp. 64-84
1888	Mejeri-6	259.5	4990	183	173	170	91.2	13.5	23.3	167	21	40	22	228	210	7.7	0.0	7.7	0.0	5:8, pp. 64-84
1888	Mejeri-7	115	4702	145	108	206	95.0	18.4	25.1	138	16	52	22	206	176	5.1	0.0	5.1	0.0	5:8, pp. 64-84
1888	Mejeri-8	75	5682	205	148	n/a	90.7	7.4	n/a	186	11	43	16	240	213	7.3	0.0	7.3	0.0	5:8, pp. 64-84
1888	Mejeri-9	49.5	5039	157	15	113	92.5	25.0	25.0	147	4	31	21	182	171	0.9	0.0	0.9	0.0	5:8, pp. 64-84
1888	Mejeri-10	127.5	4642	166	88	98	94.5	14.0	23.5	158	11	41	15	211	185	4.5	0.0	4.5	0.0	5:8, pp. 64-84
1888	Mejeri-11	83	4961	168	160	198	93.1	18.5	23.5	158	23	47	17	228	199	6.5	0.0	6.5	0.0	5:8, pp. 64-84
1888	Mejeri-12	178	4436	162	168	187	95.3	14.0	24.5	153	20	46	13	219	187	8.0	0.0	8.0	0.0	5:8, pp. 64-84
1888	Mejeri-13	155.5	5666	225	183	138	97.0	13.8	27.0	219	22	37	27	279	269	6.3	0.0	6.3	0.0	5:8, pp. 64-84
1888	Mejeri-14	111	4172	153	125	166	91.3	11.0	23.7	142	12	40	19	193	172	6.8	0.0	6.8	0.0	5:8, pp. 64-84
1888	Mejeri-15	200.5	5216	177	178	345	96.3	16.5	22.9	171	24	74	38	269	233	6.4	0.0	6.4	0.0	5:8, pp. 64-84
1888	Mejeri-16	75.5	4161	138	183	166	89.1	16.5	25.5	124	27	46	18	196	169	10.2	0.0	10.2	0.0	5:8, pp. 64-84
1888	Mejeri-17	32	6496	164	147	231	88.0	16.0	22.5	145	21	52	28	218	194	7.1	0.0	7.1	0.0	5:8, pp. 64-84
1888	Mejeri-18	61	4528	159	67	162	95.5	18.0	22.6	153	11	54	39	217	203	3.1	0.0	3.1	0.0	5:8, pp. 64-84
1888	Mejeri-19	32.5	5376	183	75	102	92.2	7.2	28.5	168	5	29	20	203	194	4.0	0.0	4.0	0.0	5:8, pp. 64-84
1888	Mejeri-20	100	4459	141	96	159	98.0	17.0	24.1	139	15	39	15	192	168	5.3	0.0	5.3	0.0	5:8, pp. 64-84
1888	Mejeri-21	180	4709	161	44	93	92.0	15.0	24.0	149	6	24	19	179	174	2.4	0.0	2.4	0.0	5:8, pp. 64-84
1888	Mejeri-22	41.5	4762	161	- <sup>6</sup>	267	93.0	- <sup>6</sup>	24.4	150	- <sup>6</sup>	68	34	218	183	0.0	0.0	0.0	0.0	5:8, pp. 64-84
1888	Mejeri-23	48	5240	184	94	231	102.0	12.8	22.2	188	12	54	16	254	216	4.5	0.0	4.5	0.0	5:8, pp. 64-84
1889	Mejeri-1	107.5	4686	151	205	225	98.7	15.5	26.8	151	25	73	40	249	216	7.9	0.0	7.9	0.0	5:9, pp. 72-99
1889	Mejeri-2	78	4334	149	135	216	97.7	16.5	29.5	146	20	64	30	230	195	6.5	0.0	6.5	0.0	5:9, pp. 72-99
1889	Mejeri-3	127.5	5167	192	76	n/a	95.0	13.0	n/a	186	8	31	19	226	214	3.0	0.0	3.0	0.0	5:9, pp. 72-99

1889	Mejeri-4	143	4271	137	210	140	98.9	15.4	27.5	137	29	45	28	211	194	10.3	0.0	10.3	0.0	5:9, pp. 72-99
1889	Mejeri-5	36.5	4959	171	158	183	97.6	12.8	28.6	169	17	52	32	238	217	6.4	0.0	6.4	0.0	5:9, pp. 72-99
1889	Mejeri-6	264.5	4436	156	122	166	98.0	12.3	28.8	152	13	48	26	214	192	6.0	0.0	6.0	0.0	5:9, pp. 72-99
1889	Mejeri-7	168.5	4818	178	178	234	102.1	11.0	28.0	180	16	66	36	262	232	6.7	0.0	6.7	0.0	5:9, pp. 72-99
1889	Mejeri-8	140	4240	142	107	147	100.3	13.5	28.0	143	13	41	21	197	178	5.8	0.0	5.8	0.0	5:9, pp. 72-99
1889	Mejeri-9	170	2646	92	41	164	96.5	16.0	27.3	89	6	48	23	142	117	3.3	0.0	3.3	0.0	5:9, pp. 72-99
1889	Mejeri-10	277.4	2863	93	48	170	97.2	19.0	29.4	90	9	56	31	155	130	3.9	0.0	3.9	0.0	5:9, pp. 72-99
1889	Mejeri-11	87	4662	154	124	180	98.3	20.9	28.2	154	22	51	14	227	190	5.9	0.0	5.9	0.0	5:9, pp. 72-99
1889	Mejeri-12	160	4555	154	123	321	100.0	14.5	29.0	153	14	93	46	260	213	4.8	0.0	4.8	0.0	5:9, pp. 72-99
1889	Mejeri-13	145	5180	202	173	270	98.0	12.0	29.0	201	17	79	46	297	264	5.4	0.0	5.4	0.0	5:9, pp. 72-99
1889	Mejeri-14	84	5095	172	127	171	97.7	6.8	29.5	163	9	50	19	222	190	7.0	0.0	7.0	0.0	5:9, pp. 72-99
1889	Mejeri-15	208.5	5416	205	110	214	102.0	15.3	28.2	210	13	63	28	286	251	3.6	0.0	3.6	0.0	5:9, pp. 72-99
1889	Mejeri-16	74.5	4157	121	189	152	95.2	16.5	29.3	125	28	62	33	215	186	9.5	0.0	9.5	0.0	5:9, pp. 72-99
1889	Mejeri-17	27.5	6711	196	173	109	94.4	16.0	25.9	186	28	28	10	242	224	8.0	0.0	8.0	0.0	5:9, pp. 72-99
1889	Mejeri-18	58.5	4390	160	48	163 <sup>3</sup>	100.5	18.0	35.0 <sup>3</sup>	162	8	57	37	227	208	2.2	0.0	2.2	0.0	5:9, pp. 72-99
1889	Mejeri-19	29	4909	166	49	270	95.7	13.5	28.7	161	7	77	43	245	210	2.4	0.0	2.4	0.0	5:9, pp. 72-99
1889	Mejeri-20	50	5315	186	143	245	107.0	12.9	27.1	199	17	68	29	284	245	5.5	0.0	5.5	0.0	5:9, pp. 72-99
1889	Mejeri-21	200	3965	127	65	96	93.5	15.0	26.0	120	9	25	17	154	145	4.2	0.0	4.2	0.0	5:9, pp. 72-99
1889	Mejeri-22	44	4510	152	- <sup>6</sup>	224	95.5	- <sup>6</sup>	27.2	145	- <sup>6</sup>	66	37	211	182	0.0	0.0	0.0	0.0	5:9, pp. 72-99
1890	Mejeri-1	106	4559	151	153	298	95.7	17.3	29.3	145	24	92	57	261	226	6.4	0.0	6.4	0.0	5:10, pp. 86-105
1890	Mejeri-2	78	4290	142	152	177	92.2	17.4	31.6	131	23	59	35	212	188	7.2	0.0	7.2	0.0	5:10, pp. 86-105
1890	Mejeri-3	119	5570	188	65	43	93.6	13.0	30.0	182	7	27	17	216	206	2.8	0.0	2.8	0.0	5:10, pp. 86-105
1890	Mejeri-4	142.5	4678	148	247	144	92.9	16.0	29.5	138	36	46	15	219	188	12.3	0.0	12.3	0.0	5:10, pp. 86-105
1890	Mejeri-5	34.4	5389	183	221	202	92.3	13.2	32.0	170	24	68	36	262	230	8.2	0.0	8.2	0.0	5:10, pp. 86-105
1890	Mejeri-6	190	5520	202	196	192	96.0	15.0	29.4	196	24	56	19	275	238	6.9	0.0	6.9	0.0	5:10, pp. 86-105
1890	Mejeri-7	145	4720	174	122	281	87.6	11.9	28.5	154	12	80	32	246	198	5.2	0.0	5.2	0.0	5:10, pp. 86-105
1890	Mejeri-8	70	3638	117	67	212	89.8	16.5	29.7	105	10	64	45	179	160	3.9	0.0	3.9	0.0	5:10, pp. 86-105
1890	Mejeri-9	160	2404	75	47	243	93.0	16.0	28.5	69	6	72	49	146	124	3.2	0.0	3.2	0.0	5:10, pp. 86-105
1890	Mejeri-10	50	5050	163	20	148	94.5	22.3	26.8	155	3	47	22	205	180	0.8	0.0	0.8	0.0	5:10, pp. 86-105
1890	Mejeri-11	85.5	4911	156	143	275	92.8	18.8	31.2	147	22	86	42	254	210	5.7	0.0	5.7	0.0	5:10, pp. 86-105
1890	Mejeri-12	153	5015	168	159	n/a	94.9	14.5	n/a	160	18	91	44	268	222	5.7	0.0	5.7	0.0	5:10, pp. 86-105
1890	Mejeri-13	145	5883	234	304	318	95.9	13.8	31.0	227	38	96	38	361	303	9.6	0.0	9.6	0.0	5:10, pp. 86-105
1890	Mejeri-14	83	5812	200	159	n/a	92.9	11.4	28.6	187	18	76	30	282	236	7.0	0.0	7.0	0.0	5:10, pp. 86-105
1890	Mejeri-15	202	5188	183	126	257	97.8	16.1	30.4	180	24	78	24	283	228	6.8	0.0	6.8	0.0	5:10, pp. 86-105
1890	Mejeri-16	75.5	4053	132	179	206	89.6	16.5	31.5	120	27	72	35	218	182	9.2	0.0	9.2	0.0	5:10, pp. 86-105
1890	Mejeri-17	29	5209	151	115	156	87.8	16.0	32.0	135	16	50	35	201	186	5.8	0.0	5.8	0.0	5:10, pp. 86-105

1890	Mejeri-18	61	5146	153	65	162 <sup>3</sup>	94.5	18.0	38.0 <sup>3</sup>	145	9	61	43	215	197	2.7	0.0	2.7	0.0	5:10, pp. 86-105
1890	Mejeri-19	31	5139	171	112	161	86.9	16.2	28.4	152	18	46	37	216	207	5.6	0.0	5.6	0.0	5:10, pp. 86-105
1890	Mejeri-20	47	5053	178	132	235	101.2	13.2	30.1	180	16	71	34	266	230	5.4	0.0	5.4	0.0	5:10, pp. 86-105
1890	Mejeri-21	190	4667	171	95	177	98.0	15.0	32.0	168	13	58	45	239	226	3.9	0.0	3.9	0.0	5:10, pp. 86-105
1890	Mejeri-22	42.5	4537	158	- <sup>6</sup>	286	91.6	- <sup>6</sup>	28.3	144	- <sup>6</sup>	92	53	237	197	0.0	0.0	0.0	0.0	5:10, pp. 86-105
1890	Mejeri-23	170	4820	177	185	262	97.1	10.5	29.5	173	17	78	41	268	231	7.4	0.0	7.4	0.0	5:10, pp. 86-105
1890	Mejeri-24	177.5	4821	180	68	326	91.5	16.1	29.1	167	11	87	50	265	228	3.1	0.0	3.1	0.0	5:10, pp. 86-105
1890	Mejeri-25	140	4364	151	103	148	93.0	14.0	30.0	141	11	44	19	197	172	4.8	0.0	4.8	0.0	5:10, pp. 86-105
1890	Mejeri-26	269	2957	94	51	135	94.0	17.5	31.0	87	8	43	30	138	125	3.7	0.0	3.7	0.0	5:10, pp. 86-105
1891	Mejeri-1	106	4560	151	182	311	98.6	18.0	28.1	150	30	83	47	262	226	7.6	0.0	7.6	0.0	5:11, pp. 120-39
1891	Mejeri-2	77	3722	123	118	190	94.2	18.8	26.8	116	20	51	20	187	155	7.0	0.0	7.0	0.0	5:11, pp. 120-39
1891	Mejeri-3	145	3578	129	123	116	99.3	12.5	26.0	132	14	35	10	181	155	7.5	0.0	7.5	0.0	5:11, pp. 120-39
1891	Mejeri-4	143.5	4168	133	163	147	95.2	17.0	27.0	126	25	44	30	195	180	8.5	0.0	8.5	0.0	5:11, pp. 120-39
1891	Mejeri-5	35.8	5080	175	219	148	96.2	16.9	29.2	170	32	44	20	246	222	8.9	0.0	8.9	0.0	5:11, pp. 120-39
1891	Mejeri-6	197.5	4695	178	213	214	98.0	14.0	29.3	174	27	62	28	263	229	8.7	0.0	8.7	0.0	5:11, pp. 120-39
1891	Mejeri-7	149.5	4555	173	150	224	95.9	13.0	30.6	170	18	69	21	256	209	6.7	0.0	6.7	0.0	5:11, pp. 120-39
1891	Mejeri-8	66.5	3379	117	34	201	93.9	17.0	27.3	111	6	55	30	171	146	2.3	0.0	2.3	0.0	5:11, pp. 120-39
1891	Mejeri-9	162.5	3131	102	57	176	96.1	20.0	27.4	97	9	49	17	155	123	3.9	0.0	3.9	0.0	5:11, pp. 120-39
1891	Mejeri-10	44	5565	189	46	208	96.5	25.0	27.3	184	9	63	33	257	226	1.7	0.0	1.7	0.0	5:11, pp. 120-39
1891	Mejeri-11	84.5	4943	159	165	189	95.5	25.6	29.7	154	33	56	16	243	203	6.5	0.0	6.5	0.0	5:11, pp. 120-39
1891	Mejeri-12	163	5045	162	175	n/a	99.9	14.0	n/a	163	22	116	21	301	206	7.9	0.0	7.9	0.0	5:11, pp. 120-39
1891	Mejeri-13	82	4465	169	105	163	98.8	19.5	27.5	167	19	45	29	231	215	4.7	0.0	4.7	0.0	5:11, pp. 120-39
1891	Mejeri-15	184	5726	197	190	371	98.5	17.7	29.8	194	46	111	48	351	288	9.4	0.0	9.4	0.0	5:11, pp. 120-39
1891	Mejeri-16	77.5	4223	136	171	232	94.9	19.0	29.5	131	29	70	33	230	193	8.3	0.0	8.3	0.0	5:11, pp. 120-39
1891	Mejeri-17	32	5369	156	147	151	94.0	20.0	28.3	149	26	43	29	218	204	6.7	0.0	6.7	0.0	5:11, pp. 120-39
1891	Mejeri-18	58	4463	164	108	n/a	100.5	22.0	n/a	165	21	75	54	261	240	4.2	0.0	4.2	0.0	5:11, pp. 120-39
1891	Mejeri-19	29.5	5283	172	90	158	90.9	26.7	26.5	159	24	42	27	225	210	4.5	0.0	4.5	0.0	5:11, pp. 120-39
1891	Mejeri-20	101	5036	194	99	196	98.3	18.0	29.2	191	17	61	33	269	241	4.0	0.0	4.0	0.0	5:11, pp. 120-39
1891	Mejeri-21	196	3578	71 <sup>9</sup>	33 <sup>9</sup>	96	99.8	19.1 <sup>9</sup>	29.5	75	6	29 <sup>9</sup>	25	110	106	3.2	0.0	3.2	0.0	5:11, pp. 120-39
1891	Mejeri-22	45	4400	146	- <sup>6</sup>	259	94.8	- <sup>6</sup>	27.1	139	- <sup>6</sup>	78	37	217	176	0.0	0.0	0.0	0.0	5:11, pp. 120-39
1891	Mejeri-23	170	5211	189	175	249	99.8	15.1	30.5	190	24	76	36	290	251	6.5	0.0	6.5	0.0	5:11, pp. 120-39
1891	Mejeri-24	180	5047	184	68	302	94.8	26.0	27.9	176	14	84	42	275	232	2.5	0.0	2.5	0.0	5:11, pp. 120-39
1891	Mejeri-25	150.5	5101	172	192	204	99.4	15.0	29.2	183	26	67	28	277	238	7.6	0.0	7.6	0.0	5:11, pp. 120-39
1891	Mejeri-26	45.5	5267	189	149	129	110.7	17.3	30.8	210	23	40	5	273	238	5.9	0.0	5.9	0.0	5:11, pp. 120-39
1891	Mejeri-27	137	3824	134	96	99	98.9	14.0	28.0	134	11	38	19	182	164	4.9	0.0	4.9	0.0	5:11, pp. 120-39
1891	Mejeri-28	35.5	4517	155	47	232	93.2	21.0	28.1	144	9	69	40	222	193	2.4	0.0	2.4	0.0	5:11, pp. 120-39

1892	Mejeri-1	108	4151	140	166	307	100.4	20.0	29.2	144	30	95	52	268	225	6.9	0.0	6.9	0.0	5:12, pp. 120-37
1892	Mejeri-2	78	4030	133	131	179	105.4	21.8	31.5	139	26	65	33	230	199	6.2	0.0	6.2	0.0	5:12, pp. 120-37
1892	Mejeri-3	144	4020	147	149	128	103.8	16.0	29.0	157	21	42	10	221	188	7.4	0.0	7.4	0.0	5:12, pp. 120-37
1892	Mejeri-4	139	3692	126	156	145	100.4	20.0	31.0	126	28	50	32	204	186	7.8	0.0	7.8	0.0	5:12, pp. 120-37
1892	Mejeri-5	35.5	5503	194	250	206	99.6	17.0	31.6	193	38	71	46	302	276	8.4	0.0	8.4	0.0	5:12, pp. 120-37
1892	Mejeri-6	44.5	4059	135	- <sup>6</sup>	335	98.8	- <sup>6</sup>	28.8	134	- <sup>6</sup>	96	44	230	178	0.0	0.0	0.0	0.0	5:12, pp. 120-37
1892	Mejeri-7	158	4331	162	179	282	101.0	13.5	31.8	167	20	90	39	277	226	7.0	0.0	7.0	0.0	5:12, pp. 120-37
1892	Mejeri-8	66	3183	120	51	185	99.8	20.0	30.6	120	9	57	32	187	161	3.0	0.0	3.0	0.0	5:12, pp. 120-37
1892	Mejeri-9	164	3088	100	87	166	98.4	16.0	30.1	97	11	54	30	162	138	5.3	0.0	5.3	0.0	5:12, pp. 120-37
1892	Mejeri-10	46	5207	174	14	231	100.0	20.0	31.0	177	3	74	40	253	220	0.6	0.0	0.6	0.0	5:12, pp. 120-37
1892	Mejeri-11	39	4800	154	30	308	98.5	25.0	31.2	153	6	79	49	238	208	1.2	0.0	1.2	0.0	5:12, pp. 120-37
1892	Mejeri-12	178	4345	138	138	401	103.8	15.0	30.6	144	19	123	57	286	220	5.8	0.0	5.8	0.0	5:12, pp. 120-37
1892	Mejeri-13	65	3976	152	75	221	95.3	19.0	31.3	148	12	73	30	233	190	3.5	0.0	3.5	0.0	5:12, pp. 120-37
1892	Mejeri-15	35	4421	150	72	222	95.8	23.0	32.4	140	13	78	52	231	205	2.9	0.0	2.9	0.0	5:12, pp. 120-37
1892	Mejeri-16	76.5	3527	117	168	213	94.9	20.0	31.0	116	30	66	28	212	174	9.1	0.0	9.1	0.0	5:12, pp. 120-37
1892	Mejeri-17	33	5592	137	108	159	98.5	25.0	30.0	138	24	48	23	210	185	5.5	0.0	5.5	0.0	5:12, pp. 120-37
1892	Mejeri-18	45	5086	183	114	402	113.3	18.2	32.3	208	19	130	35	357	262	4.1	0.0	4.1	0.0	5:12, pp. 120-37
1892	Mejeri-19	27.5	5136	178	91	198	96.2	16.2	29.2	175	15	58	49	247	238	4.0	0.0	4.0	0.0	5:12, pp. 120-37
1892	Mejeri-20	106.5	5380	196	128	227	100.5	16.5	33.2	198	19	78	52	294	269	4.5	0.0	4.5	0.0	5:12, pp. 120-37
1892	Mejeri-21	225	3775	15 <sup>10</sup>	4 <sup>10</sup>	59	105.0	17.5	44.3	16 <sup>10</sup>	1 <sup>10</sup>	26	8	43	25	1.7	0.0	1.7	0.0	5:12, pp. 120-37
1892	Mejeri-22	163.5	4830	142	196	304	102.0	15.0	30.0	149	26	94	54	270	230	8.0	0.0	8.0	0.0	5:12, pp. 120-37
1892	Mejeri-23	163	4896	170	158	394	104.8	18.0	28.8	179	26	114	66	318	271	5.5	0.0	5.5	0.0	5:12, pp. 120-37
1892	Mejeri-24	175	4792	176	151	206	98.1	16.0	31.4	174	19	65	39	259	233	5.4	0.0	5.4	0.0	5:12, pp. 120-37
1892	Mejeri-25	265	4750	164	81	174	100.8	20.1	30.3	166	13	53	29	231	207	3.2	0.0	3.2	0.0	5:12, pp. 120-37
1893	Mejeri-1	106.5	4649	157	163	287	96.5	15.0	31.2	151	22	90	50	263	223	6.9	0.0	6.9	0.0	5:13, pp. 106-127
1893	Mejeri-2	78	4009	132	100	209	96.9	17.2	31.8	128	15	67	32	211	176	5.3	0.0	5.3	0.0	5:13, pp. 106-127
1893	Mejeri-3	152	3510	115	114	136	100.1	13.0	34.3	115	13	53	27	182	156	6.9	0.0	6.9	0.0	5:13, pp. 106-127
1893	Mejeri-4	138	4201	128	178	102	98.3	14.5	31.0	126	23	45	29	194	178	9.4	0.0	9.4	0.0	5:13, pp. 106-127
1893	Mejeri-5	36.2	4052	143	156	193	96.2	15.0	32.3	138	19	66	35	222	191	6.8	0.0	6.8	0.0	5:13, pp. 106-127
1893	Mejeri-6	43	4535	157	- <sup>6</sup>	213	93.9	- <sup>6</sup>	32.5	147	- <sup>6</sup>	69	44	217	192	0.0	0.0	0.0	0.0	5:13, pp. 106-127
1893	Mejeri-7	160	4620	171	155	328	94.8	11.5	31.9	163	14	104	47	282	225	5.7	0.0	5.7	0.0	5:13, pp. 106-127
1893	Mejeri-8	65	3462	133	58	73	97.2	17.3	29.2	129	8	21	6	159	144	3.5	0.0	3.5	0.0	5:13, pp. 106-127
1893	Mejeri-9	162.5	2663	89	71	159	94.1	12.0	31.1	84	8	50	22	141	113	6.1	0.0	6.1	0.0	5:13, pp. 106-127
1893	Mejeri-10	197	4666	173	132	165	99.0	18.0	32.5	171	21	54	23	246	215	5.8	0.0	5.8	0.0	5:13, pp. 106-127
1893	Mejeri-11	40	4475	148	14	264	95.0	14.9	33.4	141	2	68	39	212	183	0.8	0.0	0.8	0.0	5:13, pp. 106-127
1893	Mejeri-12	173	4180	128	89	267	97.2	17.5	32.7	124	12	105	47	241	184	3.9	0.0	3.9	0.0	5:13, pp. 106-127

1893	Mejeri-13	74.5	4497	159	76	169	97.8	16.5	30.0	154	10	55	26	219	191	3.4	0.0	3.4	0.0	5:13, pp. 106-127
1893	Mejeri-15	36	3959	142	41	205	91.0	19.0	35.2	130	7	76	50	213	187	2.1	0.0	2.1	0.0	5:13, pp. 106-127
1893	Mejeri-16	168.5	4277	159	145	189	98.9	12.0	32.2	157	16	66	25	239	198	6.8	0.0	6.8	0.0	5:13, pp. 106-127
1893	Mejeri-17	34.3	5541	143	114	120	95.3	21.5	30.5	135	23	37	18	195	176	6.4	0.0	6.4	0.0	5:13, pp. 106-127
1893	Mejeri-18	53.5	4875	173	147	222	105.1	14.4	30.3	181	19	61	29	261	229	6.0	0.0	6.0	0.0	5:13, pp. 106-127
1893	Mejeri-19	30.5	4644	156	74	155	91.7	14.5	29.9	143	11	48	29	202	182	4.2	0.0	4.2	0.0	5:13, pp. 106-127
1893	Mejeri-20	106.5	5307	216	69	184	97.4	13.0	32.5	210	8	64	34	282	252	2.6	0.0	2.6	0.0	5:13, pp. 106-127
1893	Mejeri-21	182	4372	159	158	316	99.9	13.0	31.0	159	18	98	51	276	229	6.5	0.0	6.5	0.0	5:13, pp. 106-127
1893	Mejeri-22	160.5	4780	151	159	244	100.6	15.0	31.8	153	19	82	49	254	221	6.0	0.0	6.0	0.0	5:13, pp. 106-127
1893	Mejeri-23	276	5086	175	102	146	96.3	13.3	33.1	169	11	50	33	229	212	3.9	0.0	3.9	0.0	5:13, pp. 106-127
1893	Mejeri-24	209	5552	188	148	254	97.1	16.0	33.4	183	19	85	36	286	238	5.2	0.0	5.2	0.0	5:13, pp. 106-127
1893	Mejeri-25	177.5	4548	164	131	249	94.8	14.5	30.5	155	15	76	42	246	212	5.2	0.0	5.2	0.0	5:13, pp. 106-127
1894	Mejeri-1	112	4471	153	165	382	86.6	15.0	28.4	133	22	111	67	266	222	6.9	0.0	6.9	0.0	5:14, pp. 102-19
1894	Mejeri-2	78	4051	138	100	203	89.2	16.4	29.3	119	15	61	30	195	163	5.9	0.0	5.9	0.0	5:14, pp. 102-19
1894	Mejeri-3	142	3661	129	79	180	88.5	12.0	29.0	112	8	52	15	172	135	4.9	0.0	4.9	0.0	5:14, pp. 102-19
1894	Mejeri-4	88	5643	179	178	211	88.7	11.0	28.4	161	18	64	34	242	213	7.8	0.0	7.8	0.0	5:14, pp. 102-19
1894	Mejeri-5	35.2	5566	187	254	158	87.8	13.5	30.4	167	29	51	25	247	221	10.3	0.0	10.3	0.0	5:14, pp. 102-19
1894	Mejeri-6	43	4564	156	- <sup>6</sup>	240	85.9	- <sup>6</sup>	32.0	133	- <sup>6</sup>	77	53	210	186	0.0	0.0	0.0	0.0	5:14, pp. 102-19
1894	Mejeri-7	159	4475	167	167	291	86.5	10.0	30.0	147	15	87	37	249	199	7.9	0.0	7.9	0.0	5:14, pp. 102-19
1894	Mejeri-8	64.5	3555	140	47	187	91.8	14.5	26.5	128	6	49	31	184	165	2.4	0.0	2.4	0.0	5:14, pp. 102-19
1894	Mejeri-9	165	2815	91	87	212	86.4	12.1	28.3	77	9	65	34	150	120	6.1	0.0	6.1	0.0	5:14, pp. 102-19
1894	Mejeri-10	74	4104	159	167	160	88.1	11.0	30.2	140	17	51	29	208	186	8.4	0.0	8.4	0.0	5:14, pp. 102-19
1894	Mejeri-11	203.5	5337	178	134	269	89.6	19.1	29.0	160	21	78	36	259	217	5.3	0.0	5.3	0.0	5:14, pp. 102-19
1894	Mejeri-12	166.5	4436	152	74	292	91.7	13.5	30.7	140	9	90	32	238	180	3.7	0.0	3.7	0.0	5:14, pp. 102-19
1894	Mejeri-13	82	4399	158	78	197	88.2	13.5	27.1	143	9	54	18	205	169	4.1	0.0	4.1	0.0	5:14, pp. 102-19
1894	Mejeri-15	36	4396	155	63	249	85.0	18.0	31.8	131	10	86	49	227	190	3.1	0.0	3.1	0.0	5:14, pp. 102-19
1894	Mejeri-16	175	4294	156	136	242	91.9	16.0	30.4	143	19	75	30	237	192	6.4	0.0	6.4	0.0	5:14, pp. 102-19
1894	Mejeri-18	22	7067	263	334	221	93.4	13.5	29.5	246	41	65	33	352	320	9.8	0.0	9.8	0.0	5:14, pp. 102-19
1894	Mejeri-19	168	4272	156	89	278	86.8	12.0	27.6	134	9	77	36	220	179	4.1	0.0	4.1	0.0	5:14, pp. 102-19
1894	Mejeri-20	109	4714	189	60	183	87.4	14.0	29.2	165	8	56	37	229	209	2.7	0.0	2.7	0.0	5:14, pp. 102-19
1894	Mejeri-21	274	5399	188	91	183	88.5	12.0	30.5	165	9	59	40	234	215	3.8	0.0	3.8	0.0	5:14, pp. 102-19
1894	Mejeri-22	172.5	4591	158	122	223	88.8	11.5	29.3	144	12	66	42	222	197	5.5	0.0	5.5	0.0	5:14, pp. 102-19
1895	Mejeri-1	115.5	4542	163	167	284	83.1	19.5	25.3	135	28	70	30	232	193	7.7	0.0	7.7	0.0	5:15, pp. 118-37
1895	Mejeri-2	78	4350	138	98	280	80.9	16.3	25.0	110	14	70	41	195	165	5.6	0.0	5.6	0.0	5:15, pp. 118-37
1895	Mejeri-3	54	5504	- <sup>10</sup>	- <sup>10</sup>	n/a	- <sup>10</sup>	- <sup>10</sup>	-	- <sup>10</sup>	- <sup>10</sup>	35	(9)	35	(9)	0.0	0.0	0.0	0.0	5:15, pp. 118-37
1895	Mejeri-4	87.5	5402	189	162	184	87.0	11.8	18.8	164	15	44	22	223	202	6.6	0.0	6.6	0.0	5:15, pp. 118-37

1895	Mejeri-5	33.7	5616	192	265	287	83.8	15.0	23.8	161	36	69	39	265	235	10.5	0.0	10.5	0.0	5:15, pp. 118-37
1895	Mejeri-6	43	5331	201	- <sup>6</sup>	233	89.3	- <sup>6</sup>	26.7	180	- <sup>6</sup>	62	38	242	218	0.0	0.0	0.0	0.0	5:15, pp. 118-37
1895	Mejeri-7	102	5065	151	66	353	84.2	14.0	24.0	136	8	91	49	235	193	3.2	0.0	3.2	0.0	5:15, pp. 118-37
1895	Mejeri-8	63.5	3657	144	55	153	81.3	16.0	23.1	117	9	35	15	161	141	4.1	0.0	4.1	0.0	5:15, pp. 118-37
1895	Mejeri-9	159	3373	110	113	250	81.5	14.0	24.5	90	13	61	24	164	126	7.5	0.0	7.5	0.0	5:15, pp. 118-37
1895	Mejeri-10	73.5	4205	162	166	174	79.4	13.0	25.3	129	19	44	21	192	168	9.1	0.0	9.1	0.0	5:15, pp. 118-37
1895	Mejeri-11	208.5	5527	208	218	240	84.0	16.8	25.4	175	29	62	17	266	221	8.3	0.0	8.3	0.0	5:15, pp. 118-37
1895	Mejeri-12	164.5	5177	168	96	405	86.9	14.0	24.3	146	12	101	33	259	191	4.7	0.0	4.7	0.0	5:15, pp. 118-37
1895	Mejeri-13	80	4403	160	113	250	82.4	15.0	23.2	132	15	58	3	205	150	7.1	0.0	7.1	0.0	5:15, pp. 118-37
1895	Mejeri-15	38	4621	159	55	237	79.9	16.6	27.6	122	9	65	43	196	173	3.1	0.0	3.1	0.0	5:15, pp. 118-37
1895	Mejeri-16	171	5042	172	206	266	85.4	19.4	25.1	147	35	67	34	249	215	8.6	0.0	8.6	0.0	5:15, pp. 118-37
1895	Mejeri-17	195	5277	174	116	256	83.5	14.0	25.0	146	13	64	23	223	182	5.3	0.0	5.3	0.0	5:15, pp. 118-37
1895	Mejeri-18	25.6	6133	220	325	289	88.8	15.8	26.8	195	46	82	33	323	274	11.1	0.0	11.1	0.0	5:15, pp. 118-37
1895	Mejeri-19	267	5578	193	128	175	83.1	13.8	26.0	160	15	46	24	221	199	5.8	0.0	5.8	0.0	5:15, pp. 118-37
1895	Mejeri-20	280	4819	176	97	186	91.5	16.0	24.0	161	14	46	17	221	193	4.7	0.0	4.7	0.0	5:15, pp. 118-37
1895	Mejeri-21	165	4782	148	169	246	84.1	13.9	24.3	124	19	60	21	203	164	8.8	0.0	8.8	0.0	5:15, pp. 118-37
1896	Mejeri-1	116.5	4908	166	182	311	86.7	22.0	21.6	144	33	67	15	244	192	8.2	0.0	8.2	0.0	5:16, pp. 92-111
1896	Mejeri-2	52.8	5153	195	91	241	87.4	10.8	20.7	171	8	54	18	234	197	3.9	0.0	3.9	0.0	5:16, pp. 92-111
1896	Mejeri-3	58.5	5861	- <sup>10</sup>	- <sup>10</sup>	n/a	- <sup>10</sup>	- <sup>10</sup>	-	- <sup>10</sup>	- <sup>10</sup>	-	-	n/a	n/a	0.0	0.0	0.0	0.0	5:16, pp. 92-111
1896	Mejeri-4	91	5514	192	141	202	88.6	8.4	19.5	170	11	39	17	220	198	6.7	0.0	6.7	0.0	5:16, pp. 92-111
1896	Mejeri-5	36	5352	189	237	229	86.4	14.2	20.8	264	28	48	13	340	306	6.8	0.0	6.8	0.0	5:16, pp. 92-111
1896	Mejeri-6	45.5	5008	185	- <sup>5</sup>	290	86.7	- <sup>5</sup>	20.7	161	- <sup>5</sup>	56	23	217	184	0.0	0.0	0.0	0.0	5:16, pp. 92-111
1896	Mejeri-7	107	4917	185	147	328	91.7	25.0	22.1	170	30	75	17	274	217	5.7	0.0	5.7	0.0	5:16, pp. 92-111
1896	Mejeri-8	60	3407	127	48	218	86.7	19.0	19.6	110	7	43	10	161	127	3.1	0.0	3.1	0.0	5:16, pp. 92-111
1896	Mejeri-9	164.5	2942	99	80	238	85.8	14.5	20.8	85	9	50	9	144	103	6.5	0.0	6.5	0.0	5:16, pp. 92-111
1896	Mejeri-10	77	4161	165	164	227	86.0	11.8	22.3	142	17	51	12	210	171	8.9	0.0	8.9	0.0	5:16, pp. 92-111
1896	Mejeri-11	210.5	5225	185	187	294	87.9	15.9	21.6	163	29	65	15	257	207	9.3	0.0	9.3	0.0	5:16, pp. 92-111
1896	Mejeri-12	163.5	5229	186	93	398	90.8	14.0	22.5	169	12	92	15	273	196	4.5	0.0	4.5	0.0	5:16, pp. 92-111
1896	Mejeri-13	305	5009	184	108	160	90.5	13.0	21.8	167	13	39	18	218	197	5.1	0.0	5.1	0.0	5:16, pp. 92-111
1896	Mejeri-15	38	4223	148	44	299	85.8	19.8	22.7	128	7	68	15	203	149	2.5	0.0	2.5	0.0	5:16, pp. 92-111
1896	Mejeri-16	160.5	5252	105	152	245	95.0	11.5	23.2	100	16	58	7	174	122	11.6	0.0	11.6	0.0	5:16, pp. 92-111
1896	Mejeri-17	178.5	5483	202	204	271	90.0	14.0	21.0	184	23	57	18	263	224	7.6	0.0	7.6	0.0	5:16, pp. 92-111
1896	Mejeri-18	26.4	7274	258	417	304	92.8	14.0	23.8	239	62	69	22	370	323	14.2	0.0	14.2	0.0	5:16, pp. 92-111
1896	Mejeri-19	268	5518	189	101	209	88.4	12.2	21.4	167	10	45	18	222	195	4.4	0.0	4.4	0.0	5:16, pp. 92-111
1897	Mejeri-1	121	4742	177	112	232	87.3	11.0	26.5	152	11	61	21	224	184	5.6	0.0	5.6	0.0	5:17, pp. 60-77
1897	Mejeri-2	49.8	5286	201	80	296	86.7	11.2	26.3	176	7	84	17	268	200	3.4	0.0	3.4	0.0	5:17, pp. 60-77

1897	Mejeri-4	100	5652	193	131	238 <sup>3</sup>	88.3	8.0	31.2 <sup>3</sup>	171	8	56	22	235	202	5.5	0.0	5.5	0.0	5:17, pp. 60-77
1897	Mejeri-5	34	5445	186	237	265	84.9	11.5	26.1	158	24	62	15	244	197	10.9	0.0	10.9	0.0	5:17, pp. 60-77
1897	Mejeri-6	50	5543	204	- <sup>6</sup>	255	86.1	- <sup>6</sup>	24.0	178	- <sup>6</sup>	61	29	239	206	0.0	0.0	0.0	0.0	5:17, pp. 60-77
1897	Mejeri-7	101	4441	135	109	224	90.1	9.5	23.7	122	10	60	13	192	145	7.5	0.0	7.5	0.0	5:17, pp. 60-77
1897	Mejeri-8	57	3467	138	37	218	85.1	13.0	25.8	118	4	58	12	180	134	2.6	0.0	2.6	0.0	5:17, pp. 60-77
1897	Mejeri-9	162.5	2804	91	66	228	85.2	14.0	26.4	77	7	60	11	145	96	5.8	0.0	5.8	0.0	5:17, pp. 60-77
1897	Mejeri-10	80.5	4168	156	161	229	87.5	10.0	24.0	136	14	56	14	206	164	8.7	0.0	8.7	0.0	5:17, pp. 60-77
1897	Mejeri-11	241.5	4849	169	166	293	87.8	14.9	25.4	148	16	75	16	239	180	6.0	0.0	6.0	0.0	5:17, pp. 60-77
1897	Mejeri-12	187.5	4776	166	143	228	88.8	12.1	26.4	139	22	60	16	221	177	10.9	0.0	10.9	0.0	5:17, pp. 60-77
1897	Mejeri-13	311.5	4387	163	68	224	84.8	14.0	24.6	138	9	56	20	202	167	3.8	0.0	3.8	0.0	5:17, pp. 60-77
1897	Mejeri-14	91.5	5881	222	197	274	87.5	11.0	26.9	191	13	81	17	285	222	5.8	0.0	5.8	0.0	5:17, pp. 60-77
1897	Mejeri-15	38	4281	148	67	218	84.9	19.0	27.4	126	10	65	17	201	153	3.7	0.0	3.7	0.0	5:17, pp. 60-77
1897	Mejeri-16	157.5	5118	- <sup>10</sup>	- <sup>10</sup>	244 <sup>3</sup>	- <sup>10</sup>	- <sup>10</sup>	30.7 <sup>3</sup>	- <sup>10</sup>	- <sup>10</sup>	53	(13)	53	(13)	0.0	0.0	0.0	0.0	5:17, pp. 60-77
1897	Mejeri-17	179	5235	170	146	284	89.2	14.0	26.4	153	18	75	16	247	188	7.3	0.0	7.3	0.0	5:17, pp. 60-77
1897	Mejeri-18	180.5	5025	177	222	276 <sup>3</sup>	85.3	12.0	32.8 <sup>3</sup>	152	24	66	14	242	190	11.0	0.0	11.0	0.0	5:17, pp. 60-77
1897	Mejeri-19	263	5150	176	62	122	88.9	12.8	26.9	156	6	33	11	196	173	3.0	0.0	3.0	0.0	5:17, pp. 60-77
1898	Mejeri-1	114	5297	190	197	319	85.6	13.0	26.3	164	23	83	19	270	206	9.0	0.0	9.0	0.0	1899, pp. 136-155
1898	Mejeri-2	50.8	5375	207	41	326	82.5	14.0	26.9	173	5	88	25	266	203	1.7	0.0	1.7	0.0	1899, pp. 136-155
1898	Mejeri-4	98.3	6125	200	84	190 <sup>3</sup>	86.0	8.6	34.9 <sup>3</sup>	173	6	69	28	249	207	3.7	0.0	3.7	0.0	1899, pp. 136-155
1898	Mejeri-5	34.3	5901	89	103	167	88.3	15.4	26.5	79	13	49	10	140	102	8.4	0.0	8.4	0.0	1899, pp. 136-155
1898	Mejeri-6	49.5	5024	187	- <sup>6</sup>	253	84.1	- <sup>6</sup>	28.5	159	- <sup>6</sup>	72	26	231	185	0.0	0.0	0.0	0.0	1899, pp. 136-155
1898	Mejeri-7	106	4048	151	32	164	88.1	14.0	28.6	132	5	47	17	183	153	2.3	0.0	2.3	0.0	1899, pp. 136-155
1898	Mejeri-8	55.5	3718	144	41	179	84.8	12.6	27.6	122	5	49	16	176	143	3.0	0.0	3.0	0.0	1899, pp. 136-155
1898	Mejeri-11	228.5	5590	196	174	273	85.5	13.3	26.4	168	23	72	21	263	212	8.4	0.0	8.4	0.0	1899, pp. 136-155
1898	Mejeri-12	189	4823	167	154	281	87.1	12.0	26.0	145	17	75	13	237	176	8.2	0.0	8.2	0.0	1899, pp. 136-155
1898	Mejeri-13	292.5	4964	186	101	189	85.7	12.0	27.9	160	11	53	21	224	192	4.8	0.0	4.8	0.0	1899, pp. 136-155
1898	Mejeri-14	107	5506	186	194	212	83.7	12.9	28.6	153	23	68	15	244	191	9.6	0.0	9.6	0.0	1899, pp. 136-155
1898	Mejeri-15	37	4374	148	83	238	83.0	16.4	28.9	122	12	70	16	205	151	5.1	0.0	5.1	0.0	1899, pp. 136-155
1898	Mejeri-16	156	5494	- <sup>10</sup>	- <sup>10</sup>	132 <sup>3</sup>	- <sup>10</sup>	- <sup>10</sup>	36.0 <sup>3</sup>	- <sup>10</sup>	- <sup>10</sup>	49	12	49	12	0.0	0.0	0.0	0.0	1899, pp. 136-155
1898	Mejeri-17	178.5	5150	181	87	286	84.5	12.0	27.1	156	9	77	23	243	188	4.3	0.0	4.3	0.0	1899, pp. 136-155
1898	Mejeri-18	181.5	4543	144	137	175 <sup>3</sup>	84.0	11.3	36.0 <sup>3</sup>	126	14	63	12	203	152	8.7	0.0	8.7	0.0	1899, pp. 136-155
1898	Mejeri-19	265	4361	157	37	152	90.2	12.2	27.8	141	4	43	4	188	150	2.3	0.0	2.3	0.0	1899, pp. 136-155

## Notes and comments

Figures refer to weights (in Danish pund = 0.5 kg) and values (in Danish *kroner*, dkk) per cow.

Before 1879, data comes from different sources, so it is not always clear whether the accounts refer to the actual milk cows, or to the total of milk cows, breeding cows and older calves held on the farm, which was significantly higher. Where the number of cows had to be guessed from partial or summary figures, the number used for the calculation is given in parentheses.

Figures in italics have been calculated from other figures in the same row, e.g., values divided by volume equals price. Additionally, for early years (prior to 1878) figures per cow are calculated in most cases by dividing totals by numbers of cows. For later years figures per cow are given in *Tidsskrift for Landøkonomi*.

When prices were missing, we use the mean of prices from places where we had data for. These prices are reported in parentheses.

Hence, for earlier years, year-to-year fluctuations in milk, butter, and cheese output per cow can reflect different accounting practices referring to the number of cows as well as to the relative importance of cheese, which was clearly higher for the farms covered between 1864 and 1875 than for the bigger sample afterwards. We were unable to evaluate whether this reflects a change in relative importance in production over time or between places. It is likely a mix of both, since available (archival) data for Søholm Gods, Basnæs Gods and Hesselagergaard (the latter not used due to missing cow numbers) indicates that production of cheese became less important between the middle of the 1870s and the first half of the 1880s. Therefore, our “subsidy series” in Figure 6 seems to reflect a general trend, but might overstate it due to a likely sample selection bias before 1876/79.

The “net income from pigs” refers to the value of sold pigs (as given in the “gross” column) minus other inputs that are neither milk, skim-milk, buttermilk nor whey. For many places at early dates - including all accounts in *Tidsskrift for Landøkonomi* before the 1879 series - the actual pig production was not reported. We used reasonable assumptions following Schroll (accounts for Funen/Fyn for 1876 [4:10, pp. 558-9] and 1877 [4:12, pp. 76-77]) and Winkel (first nationwide survey for 1879 [4:14, pp. 56-61]) as well as from the archival records of Broholm (1854-65) and Basnæs Gods (for 1880) about the “value of milk-byproducts from the milk used as input for butter-making and cheese” which are fed to pigs and make up their net value. The first



assumption is that (if not otherwise stated) 97% of all milk was used for making butter. The second assumption is that the butter-milk, whey and skim-milk given to pigs had a cumulative value of: 1840-49: 0.4 øre per pund milk given into the production process, 1850-54: 0.45 øre per pund, 1855-1869: 0.5 øre per pund, 1860-1864: 0.55 øre per pund, 1865-1869: 0.6 øre per pund, 1870-74: 0.65 øre per pund and 1875-78 0.7 øre per pund. If we only had gross or net values for pigs, then the other value was reconstructed using the net-to-gross ratio for other places at the same time, which was 0.66 for 1850-64 (derived from Broholm), 0.57 for 1864-78 (based on Ourupgaard and Gjedsergaard in 1865 as reported in Tesdorpf [1867] and the farms covered by Winkel [4:14, pp. 56-61] for 1879, leading to almost identical values 0.569 vs. 0.570). These assumptions are of course artificial, since the whey and the butter-milk had no “real” market-value. Their values in the said accounts are calculated by deducting the expenses for pig fodder (which was also calculatory in many cases, given that the farms also produced such crops) from the revenue of the sold living or slaughtered pigs, and dividing the net pig value by the quantities of whey, buttermilk and skim-milk given to them (the value of skim-milk was generally calculated in the same way using the selling price of cheese). Thus, swings in pork prices and in fodder (crop) prices as well as the management of pig production and idiosyncratic circumstances (diseases, different valuation practices for inputs, etc.) can all influence the “net value of pigs” for individual farms. Pig production values estimated by either of these methods are reported in parentheses in the table.

### Specific notes

<sup>1</sup> Price = mean of summer prices from 1845-54, from Tesdorpf (1878), p. 31.

<sup>2</sup> These figures for Broholm might be incomplete due to incomplete accounts in the archival records.

<sup>3</sup> Refers to weight of pork after slaughtering, all other figures refer to living weight. For Broholm in 1856 and 1857 figures refer to a mix of both. For Søholm, it is unclear.

<sup>4</sup> From 1860-69 accounts for Broholm include Tangaagaard for everything except milk production figures; from 1862-69 also small amounts of Sødmælksost (cheese made from non-skimmed full-fat milk) were produced; the corresponding revenues are not included in our figures.

<sup>5</sup> Due to a change in the period covered, the original figures in the archival records for Søholm in 1870 refer to the six month from May to October only, so we multiplied them by 2 to obtain a series that is comparable in levels to the others.

<sup>6</sup> No cheese made; generally, this means that skim-milk was used to feed pigs and/or calves or sold directly.

<sup>7</sup> This figure from Jenkins' accounts is assumed to be for net income from milk fed to pigs.

<sup>8</sup> Sold 3 month-old piglets to a private dairy.

<sup>8</sup> Also produced (and sold) Sødmælksost (cheese from non-skimmed milk) at higher prices; this normally leads to correspondingly lower butter production.

<sup>9</sup> Milk is sold directly. As there is no import duty on milk, the implicit subsidy for these producers is 0.

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