



Food production, climate and population in the Faeroe Islands 1584-1652

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Abstract

*Time-series are reconstructed for tithes paid for cows, sheep and fish delivered as butter, wool and dried fish or stockfish. The series are analyzed for the Faeroe Islands as a whole and its six districts. Similarities, differences and peculiarities in the course of events are discussed. Milk from cows and mutton and tallow from sheep are assumed to provide 60-80% of the calorific consumption, with milk as the most important single item. These numbers, as expected, vary a great deal, and through different mechanisms they can be related to climatic variation. Least variation is found in the time-series for the number of cows, good years to bad years at 2:1. Sheep vary much more, at 3:1. Fishing is the most unstable trade, at 10:1. Particularly bad sheep years have often been mentioned in the literature and have a descriptive term, *felli*, whereas bad cow years are hardly known in the literature. High mortality among both sheep and cows occur often in the analyzed period, causing catastrophic situations for humans with hunger and death. The success or failure of local*

fishing could alter or modify the effects much: the years around 1620 especially were very good years for fishing. Addressing the question of human population, only the butter tithe is considered to be sufficiently secure. It is calculated that the population in the period from about 1600 to 1650 decreased from 3200 to 2500.

Key words

Faeroe Islands, tithe accounts, proxy data, population estimates, climatic conditions.

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*Geografisk Tidsskrift,
Danish Journal of Geography 104(2):35-46, 2004*

Published papers on the historical geography of the Faeroe Islands have concentrated upon the 19th century and the records in Faeroese archives (cf. Guttesen 1999a, 2000, 2001a, 2001b, 2001c, 2003). Some related topics are also contained in Guttesen (1987, 1992, 1996), in Brandt & Guttesen (1978, 1981) and Christiansen, Guttesen & Joensen (1986, 1987). The present paper is the first attempt to go further back to the 16th and 17th century, using the records preserved in The National Archive, *Rigsarkivet*, in Copenhagen. The purpose is to obtain a picture of the living conditions, agricultural system and output, population and climate. The steps in this paper are to analyze, evaluate and present the data in the King's tithe account for the period. What can they tell us about the production of vital necessities? Can this information be used to provide a tentative determination of the population size and development in the first part of the 17th century? The butter tithe appears to be relatively simple to evaluate, but the wool tithe is much more complex and problematic to interpret, and requires further investigations. New knowledge concerning the climatic condi-

tions, however, can be obtained. Technical note: Place-names, personal names as well as other designations are reproduced in the original orthography. For clarification of old to modern use of district names cf. Figure 1

The tithe accounts as information source

The first abundant sources appear in 1584 with the cadastre, *Jordebøger*, which comprise the King's accounts of his revenues and expenses in the Faeroe Islands. These documents also contain the tithe accounts, as the King after the Reformation in the 1530s, received the share formerly taken by the bishop.

The tithe accounts have been published in Zachariassen (1961). The reliability of Zachariassen's reproduction of the documents has been tested by spot tests, but no mistakes or significant misinterpretations have yet been found. As an example Table 1 shows the general content of the King's tithe accounts.

In Guttesen (2003; 82) there is an evaluation of the re-

Table 1: Example of the tables showing the King's tithe income for 1639. In the original documents all numbers are roman numerals. 1 Vog á 18 Skind is 15.43 kg. 1 Barrel á 7 Vogs is 108.01 kg. 1 Guilder (Gylden) is 20 Skind.

1639	Fish		Wool		Butter			Stockings	Value	
	Vog	Skind	Vog	Skd	Barrel	Vog	Skd	Pairs white	Guilder	Skind
Norderøe	7	1½	1			2		53	21	13½
Østerøe	7		10			6		25	31	
Strømøe	9		15			6		9	34	16
Sandøe	8		3	5		2	8		14	17
Vaagøe	2		5			2		35	17	
Suderøe	35		-	-	½				40	
Summa	68	1½	34	5	½	18	8	122	158	6½

liability of the accounts in general and especially for the documents for the 19th century. But here it is necessary to add a reinterpretation of the reading of some old law texts. In that paper I tried to interpret the oldest regulation on tithes from 1691, described in the statute book compiled by Bang & Bærentsen (1901). They say that a tithe is to be paid "according to old practice", and "from now on tithe shall only be paid of the sheep slaughtered". My interpretation of these statements was that they were rather meaningless. But when reading the old Minute Books, *Lagtingsbøger* edited by Joensen (1969), it is found that these statements are reactions to the new King Christian V's Norwegian Law, put into force in 1688. This law changed the old practice of paying a tithe on the number of slaughtered sheep, into a payment for every living sheep. This change in the law caused confusion, among other things resulting in proceedings against the local sheriff in Vaagøe, Zacharias Jacobsen, because he continued to collect tithes according to the old practice (Joensen 1969: 303). This provision in the Norwegian Law was annulled in 1691.

Problems in the making up of the tithe accounts: West (1985:58) distinguishes between minor and major tithes, regrettably without any reference to a source document. Minor tithes, West says, were on grain, goslings, seals and seafoal, which were retained by the district sheriff as his stipend. The major tithes were those on lambs, cows, whales and fish. But, as West added, "fish in Sandøe and Suderøe, however, counted as minor tithe", which possibly complicates the case. Furthermore, the status of the grain tithe is not unambiguous, as both Debes (1673/

1965:140-141) and Andersen (1895/1964:347) refer to it as the Priest's tithe in the northern as well as in the southern islands. In this case it must have been divided into four parts, for the King, the church, the priest and the poor. This never becomes visible in the King's tithe accounts, either in the period examined here or in the 19th century examined in Guttesen (2003). It would be illogical to collect tithe grain and send it to Denmark, and yet to export considerable amounts from Denmark to the Faeroe Islands. This problem remains a conundrum.

Butter tithe was paid for each milk-yielding cow. Consequently bulls, calves and heifers were not subject to this duty. According to Guttesen (2003:87) the number depends on the following set of conditions: Amount of winter fodder, length of winter, weather during the haymaking period, weather during the grass growing period. 1 vog of butter had the value of 1½ Gylden.

Wool tithe was paid for each slaughtered sheep or lamb. As for the other tithe payments, the wool was delivered in June when the sheep were sheared, but as the taxable sheep were not slaughtered until October, as the Matras diaries (FLS-b) clearly show, a difference can arise between the number taxed and the number slaughtered. According to the Matras diaries, the difference was usually small, and it was always equalized the next year. The number of sheep slaughtered depends on this set of conditions: the state of nutrition of the sheep at the beginning of the winter, length of winter, extraordinary events causing high mortality during the winter, weather conditions during the lambing season. 1 vog of wool was equal to 1 Gylden.

Fish tithe is in principle paid on all catches, but some

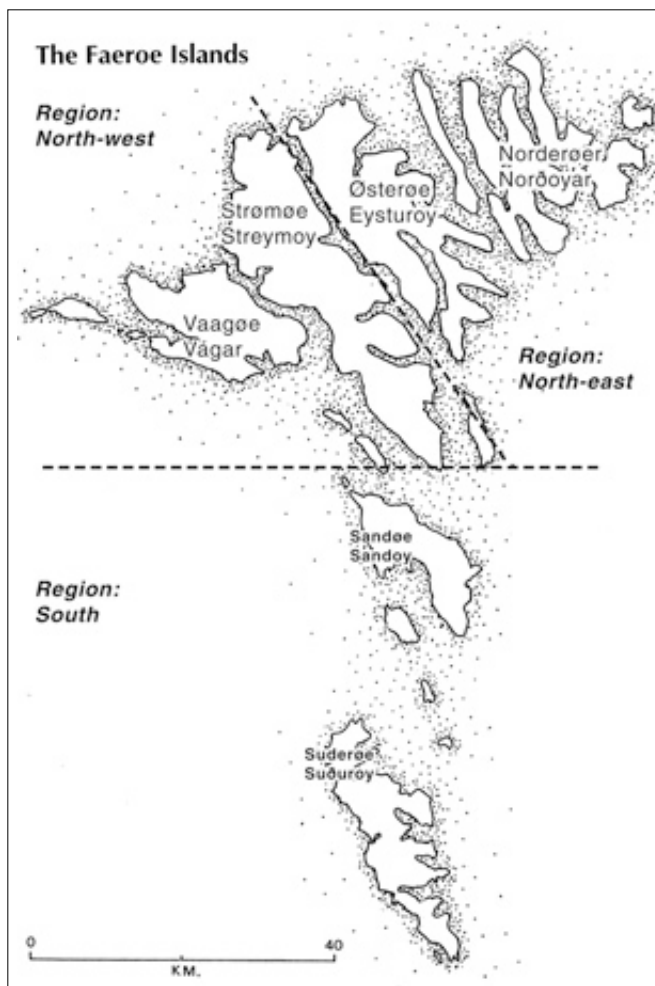


Figure 1: The Faeroe Islands' administrative division in districts, *sýslur*, with the old

more unusual species may have been excepted. The main fishing season was in the late winter and early spring. As fishing at that time was a form of hunting, in contrast to both cow and sheep rearing, the outcome of the fishing was determined by different factors: oceanographic conditions, the size and location of the fish stock, weather conditions in the season as well as tidal currents. 1 vog of stockfish is equal to 1 Gylden.

Stockings. Furthermore some accounts contain tithe payment in red or white stockings. This happens after the bad sheep years of the 1630s. Further discussion appears

below. About the same time payment in feather appears. Most years it is only collected in Suderøe, a few years also in Sandøe.

Analysis of the King's tithe accounts, 1584-1652

Butter tithe

It is assumed that the standards of tithe paying were the same in the 17th century as they were in the early 19th century (Guttesen 2003:83), as no other regulations have been found to the contrary. The main rule seems to be that 1 vog of butter was paid for every 16 cows. In the oldest preserved account for 1584 the smallest weight unit is mark. In later accounts it changed to skind. Usually 1 vog is divided into 72 marks, and 1 skind is equal to 4 marks. But when it comes to tithe paying, it seems to be the practice to pay "overweight", so here the rule is that 1 vog is equal to 80 marks. This is discussed thoroughly in Zachariassen (1961:69), but unfortunately his conclusions are ambiguous. Usually the tithe was divided into 4 parts, as mentioned above. But the butter tithe was divided only into 3 parts. Zachariassen (1961:87) says that no "farmer's part" was given, meaning that the tithe to the poor people, kept back by the farmer, was not practiced on the butter tithe. Therefore the King's tithe was a third. In the following analysis these considerations are followed.

As the vicarages (priest's farms) did not pay tithes, (Andersen 1895/1964: 347, 350) it should be kept in mind that 7 medium large farms with a population of 70-100 and perhaps 30-50 cows have to be added to the numbers calculated below, to reach the real sum for Faeroe Islands.

The Faeroe Islands as a whole: In Figure 2 to 5 the data for the butter tithe are presented. Figure 2 gives an overview of the development of the butter tithe for the Faeroe Islands as a whole. The period analyzed covers a time span of 69 years, but due to lacunas, especially in the first half, there are only 39 years with data. A trend line is added to show the general tendency, which is clearly falling through the period. Obviously there is deterioration when the number falls to 25-30 % below the preceding year or below the trend line, but there is also a period

	<i>Without overweight</i>	<i>With overweight</i>
16 cows	72 marks	80 marks
1 cow	4½ marks	5 marks
1 mark butter tithe	2/9 or 0.22 cows	1/5 or 0.20 cows
1 mark King's tithe	(2/9) x 3 = 2/3, or 0.67	3 x 0.20 or 0.60 cow

Table 2: Tithe paying in butter

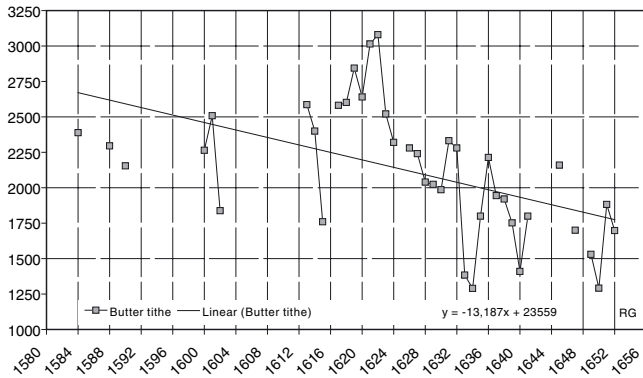


Figure 2: King's Butter tithe measured in marks (0.214 kg), Faeroe Islands 1584-1652.

of about 7 years from 1617 onwards, where the situation seemingly has been good.

When we go to the more detailed analysis of the data for the districts, *sysler*, which for convenience and clearness are gathered in north-eastern, north-western and southern regions peculiarities and uniformities appear. On the time-series for the butter tithe there is clearly a tendency toward a concentration of values at certain levels, which is especially evident for Norderøe, Østerøe and Suderøe. In the last case, interpretation is problematic. It looks as if there has been some kind of payment on account or a hidden convention about the payment, as the payment has been in either 1 or ½ barrels of butter. These two values are found in 25 out of the 39 years shown. The distribution of these values is also conspicuous, because before 1624 one barrel is paid in 12 out of 17 instances, but after 1625 the payment is ½ barrel in 13 of 22 instances. In Figure 2-5, one barrel of butter equals 560 mark weights.

If we compare the four best and the four worst years to give an approximate picture of the variability of the tithe payment in butter, then the relationship is roughly speaking 2:1, indicating a relatively stable payment and stocks of cows.

Comment on the time-series in the three regions. Figure 3 shows that the Norderøe has a relatively steady development, but with a slightly falling trend. Only 3 values, for 1621-22 and 1626 differ greatly. The values have been checked in the original documents and are correct. From 1620 until 1621 the payment rises from ½ barrel to 1 barrel. It is difficult to understand how the number of cows can double from one year to the next. So again this points towards some unwritten convention or equalizing arrangement. Of the 39 years with data, not less than 20, more than a half, have a payment in butter tithe of ½ bar-

rel. On the other hand there is certainly some uniformity in the variation, seen in relation to the other figures. For Østerøe the trend is more clearly falling over the period, and the tendency to agglomerate on certain values is less pronounced. The best years coincides with those in Norderøe, and so do the bad years in 1633-34.

In Figure 4 for Strømøe and Vaagøe the trends are by and large the same, and again some uniformity is evident in the variation between the two time-series. Strømøe shows a special feature in the development, a deviation from the five other districts, namely that the values for the

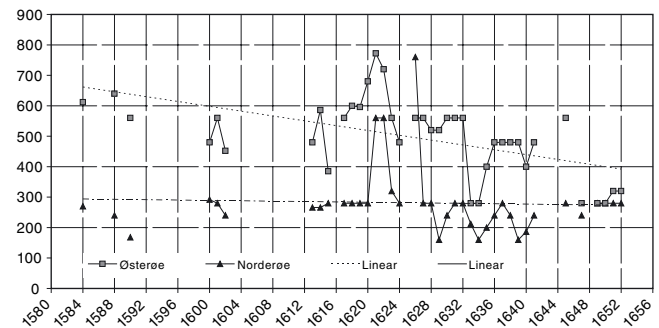


Figure 3: King's Butter tithe measured in marks (0.214kg), North-eastern region 1584-1652.

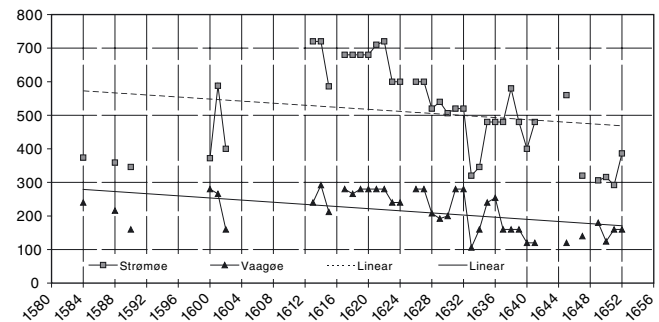


Figure 4: King's Butter tithe measured in marks (0.214 kg), North-western region, 1584-1652.

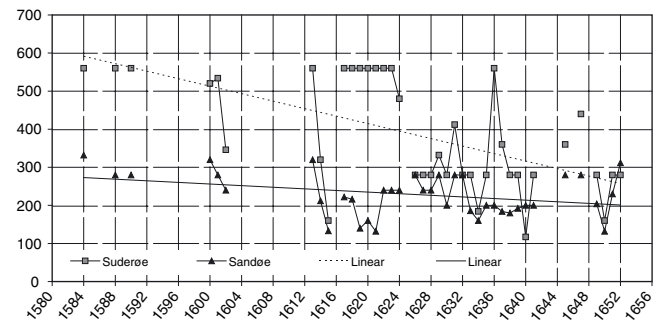


Figure 5: King's Butter tithe measured in marks (0.214 kg), 1584-1652. Southern Region 1584-1652.

Table 3: Differences among the districts in the payment of the wool tithe

Norderøe, Østerøe,	1 Vog of unwashed wool for each 80 sheep and lambs
Vaagøe	1 Vog of unwashed wool for each 80 sheep and lambs Mykines: wool was substituted by feather
Strømøe	1 Vog of unwashed wool for each 100 sheep and lambs Nolsøe, Hestøe, Kolter 2 Guilders in stockings or fish for each sheep and lambs
Sandøe	6 pairs of coarse stockings for each 100 sheep and lambs. The farm Trøðum paid, however, 1 vog of wool for 80 sheep and lambs
Suderøe	1 Guilder paid in stockings or fish for each 80 sheep and lambs

first six years before 1603 are at a relatively low level.

Figure 5 for Sandøe and Suderøe in the southern region shows events that differ clearly from the other regions, and there is also a remarkable difference between Sandøe and Suderøe. The first 6 years before 1603 seems to have been among the best for the two districts, this was not the case for the other 4 districts which are discussed above. The trend line is only falling slightly for Sandøe, which displays the afore mentioned tendency to agglomeration around two levels.

Wool tithe

Sheep, grazing in the outfield all year round, have traditionally been regarded as the main product of the Faeroe Islands. But as a food source it is second to the milk products from the cows. Wool and woolen products, which for many years correspond to knitted stockings, was the foundation of the wealth among the large farmers, (Guttesen 2000). It must be assumed that the production was optimized under the prevailing natural as well as juridical and social conditions. But there are indications that wool production had priority over food substances, mutton and tallow.

The wool tithe was, according to Guttesen (2003:83), paid as 1 Vog of unwashed wool for every 80 sheep and lambs that were slaughtered on the Norderøe. If this was the case in all districts and places, it would be simple to convert this tithe into a real number of slaughtered sheep. But it is not that easy. West (1985:58-59) has assembled valuable information about the differences among the districts in the practices of collecting the wool tithe which is presented in Table 3 below:

This difference in the payment of the wool tithe raises some problems. It is not possible at present to reach a proven conversion from the wool tithe to the number of sheep slaughtered. But it can be used as tentative approach, using the *ceteris paribus* clause, to an understand-

ing of the variability in sheep farming at that time. As I understand Zachariassen (1961:69), the custom of paying "overweight" is confined to butter, and was thus not used in relation to wool which had no loss of weight during handling and transport. But, West (1985:59) writes that the district sheriff washed and sorted the wool before handing it to the bailiff. The wool loses about a third of its weight during washing.

There are complications, when it comes to the two southern districts. Suderøe did not pay a wool tithe at all, so this tithe on sheep must somehow have been transformed into some other kind of payment, perhaps money. But this point to another tricky problem, namely that "Faroese money" usually was paid in kind, often in stockfish or sheep skins or "*skind*", where 20 skind were equal to 1 Guilder or *Gylde*. Zachariassen (1961:72) supposes that the problem for Suderøe was that the sheep were black and had very coarse wool. But this statement raises another question: how could the farmers on Suderøe be satisfied with a breed of sheep that gave an unusable variety of wool? It is known that after bad years with "felli", the breed has been renewed with sheep from the Shetlands. It makes no sense, that the wool from Suderøe was more or less unusable, remembering the saying "wool is Faeroe-gold". The solution is perhaps revealed in a letter from Sysselmand Effersøe (FLS-c) to the prefect, *Amtmand*, from 1876, where he makes an official report on irregularities in the village Kvalbø on Suderøe in the accounting of the tithe of the sheep from Lille Dimon. In this report he says: "As the States share of the tithe is granted the sheriff (*Sysselmand*) as wage..." If we assume that this arrangement from the late 19th century also existed three centuries earlier, we have a much better explanation of the missing King's tithe from Suderøe.

Sandøe pays "not very much" in wool tithe, as Zachariassen formulates it. This seems to be correct, as shown later in Figure 9. Here the payment of the wool tithe from

80 sheep and lambs	1 Vog or 72 marks weight
1 sheep	72/80 or 9/10 or 0.9 mark wool
1 mark of tithe wool is equal to	1 1/10 or 1.11 sheep
1 mark of King's tithe wool	4 x 1.11 or 4.44 sheep

Table 4: Tithe payment in wool

Sandøe is around 300 marks, but compared with the Loebner Tables from 1813 (FLS-a), the number of sheep slaughtered yearly should be somewhat higher than the number slaughtered in Vaagøe, which is 600-800. Consequently the tithe payment from Sandøe should be 2 to 3 times higher than the figure above, or 600 to 900. Possibly the wool tithe from some of the parishes or farms was used in special arrangements, as the above mentioned. Assuming, however, that the relationship between payment in kind and cash as well as other special arrangements has been constant, the following picture of the development should give a good understanding of trends.

Bad years after 1632 had the consequence that knitted stockings appear as tithe payments instead of wool. If this payment is converted to payment in wool, it would be wrong to convert the weight of one pair of stockings, weighing 2 marks or approximately 1/2 kg, directly into an equal weight of wool. The advantage of this arrangement was that the wool through this processing gained a higher value. Therefore, according to Zachariassen (1961:86), as well as in the preface of several of the original documents, the value or price of the stockings was fixed. The relationships are elaborated in Table 5.

The Faeroe Islands as a whole: Figure 6 shows data for the wool tithe as they appear in the accounts and as they will be when the payment in stockings plays an in-

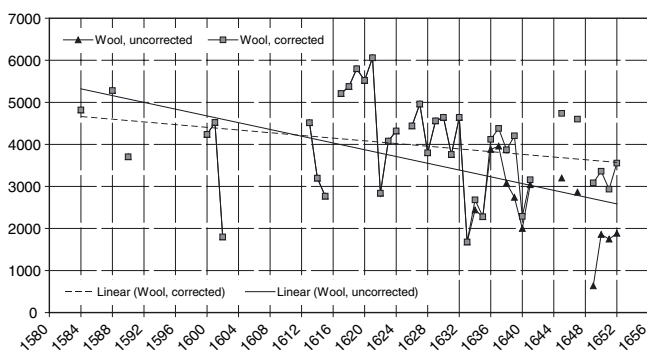


Figure 6: King's Wool tithe measured in marks (0.214 kg) Faeroe Islands 1584-1652.

Table 5: Conversion from stockings to weight of tithe wool

5 pair of white stockings = 1 Gl	1 pair = 1/5 Gl = 1/5 vog wool = 12 mark weight wool
4 pair of red stockings = 1 Gl	1 pair = 1/4 Gl = 1/4 vog Wool = 18 mark weight wool

creasing role after the bad year 1633. The trend lines are in both cases falling, but much less when the payment is corrected for stockings. There are 6 years or groups of years: 1602, 1614-15, 1622, 1633-35 and 1640 with abrupt declines seen in relation to the preceding year or the trend line. These years must be related to bad winters with high mortality among the sheep. Svabo (1782/1957) has noted that 1633 was a bad year for the sheep, *felli*, and correctly, as shown below in Figure 7, makes it clear that the Norderøer were hit hardest. But there is also one good period of five continuous years, 1617-21, that was conspicuous in Figure 2. Taking a rough estimate of the variability of the tithe payments in wool, corrected for the payments in stockings, the ratio between the four best and four worst years is by and large 3:1

The two districts in the north-eastern region, Figure 7, have a general decline. The bad years are nearly the same as mentioned above for the Faeroe Island as a whole. For Norderøe the effect seems to be catastrophic in the 30s when there is no payment of the wool tithe in 1633 and 1635 and again 1640-41. The sheep stock was not extinct totally, but the farmers in distress seem to have been relieved of their duties for some years.

The north-western districts, Figure 8, also show a falling trend, and the two time-series show by and large the same movements. For Strømøe the good years around

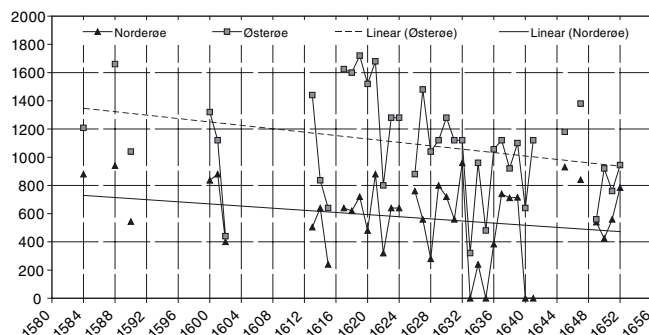


Figure 7: King's Wool tithe measured in marks (0.214kg) North-eastern region 1584-1652.

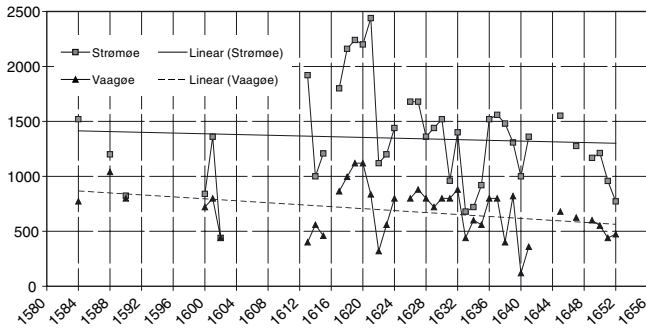


Figure 8: King's Wool tithe measured in marks (0.214 kg), North-western region 1584-1652.

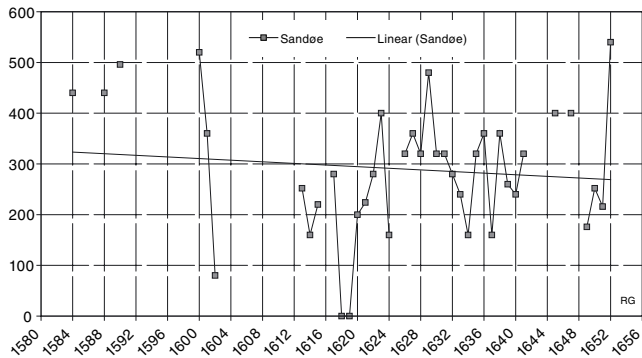


Figure 9: King's Wool tithe measured in marks (0.214 kg), Southern Region, 1584-1652.

1620 are markedly higher than the periods before and after. The five extreme bad years, depicted in Figure 6, also penetrates these two districts.

In the southern region just Sandøe is represented, as Suderøe never paid wool tithe to the King in this study period as mentioned before. If Suderøe paid tithe to the priest, the church and the poor, can not yet be documented, but in all probability they did. Sandøe's time-series has, cf. Figure 9, a conspicuous low level and course of events. There must be some, until now undetected and undescribed mechanisms, conventions or rules. These problems will be taken up in the discussion below.

Fish tithe

General comments.

The fishing and consequently the fish tithe can be expected to show different patterns than the products from agriculture. Cows and sheep are parts of the basic agricultural system on which Faroese society was based. Fishing, on the other hand, was much more unreliable, fluctuating greatly because of variations in ocean currents as well as

in fish stocks, their movements and migration, and not least because of the changing weather conditions.

Faeroe Islands as a whole.

Figure 10 shows the development in the fish tithe. The fluctuations are much greater than for butter and wool. Furthermore there is no clear trend in the development. On the contrary there are seemingly three periods with different levels. Up to 1610 the relatively few data indicate modest fishing with around 5,000 marks weight in tithe payment. A middle period, around 1613 to 1624, has markedly greater fishing, with a peak in 1622 of 25,000 marks weight in tithe payment. In the rest of the period, after 1625, the level is about the same as in the first period, around 5,000 or a little higher.

If we take the four worst years and relate them to the four best years, this gives an approximate ratio of about 10:1. This can be taken to indicate that the fishing trade could never have been stable or secure enough to be the basic industry upon which the former Faeroese society was based. In the good fishing periods, though, it must have resulted in some kind of abundance.

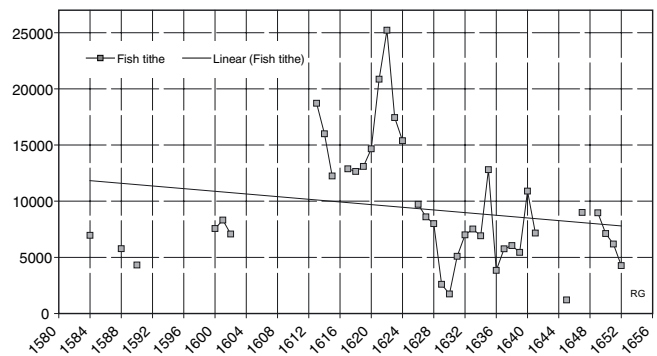


Figure 10: King's Fish tithe measured in marks (0.214 kg), Faeroe Islands 1584-1652.

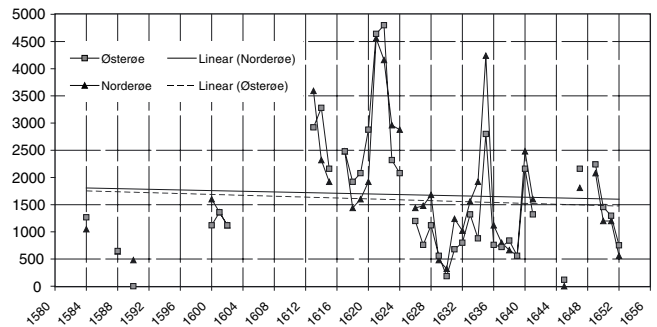


Figure 11: King's Fish tithe measured in marks (0.214kg), North-eastern region 1584-1652.

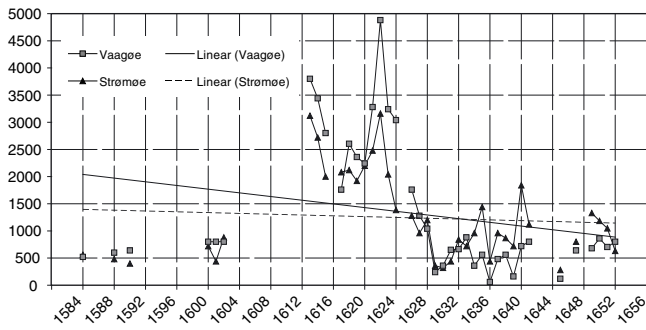


Figure 12: King's Fish tithe measured in marks (0.214 kg), North-western region 1584-1652.

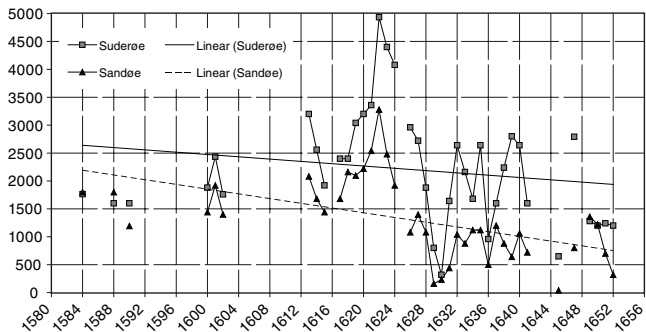


Figure 13: King's Fish tithe measured in marks (0.214 kg), Southern Region 1584-1652.

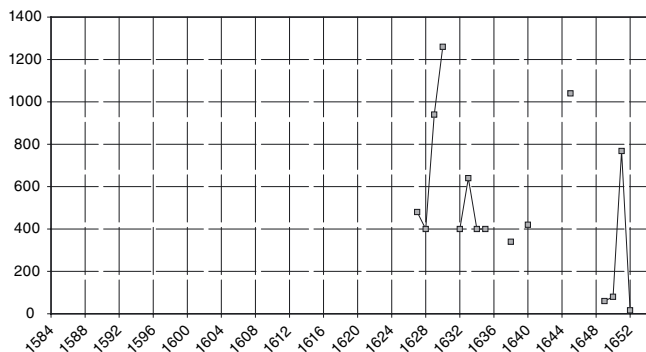


Figure 14: King's Feather tithe measured in marks (0.214 kg), Faeroe Islands 1627-1652.

The regional distribution of fish tithe payment.

The figures 11, 12 and 13 show the regional variation in tithe paying. By and large there is some kind of contemporaneity in the course of events. There are some very good years 1621-22, and a bad period 1629-30, and these coincide almost with good and bad years for butter and wool.

The northern districts that are assumed to fish on the fishing grounds just north of the Islands, *Norðhavið*, in

late winter and early spring, have a remarkable good year in 1635 which is not standing out in the time-series for the other districts. Furthermore the Suderøe separates from the other by having a generally higher but very fluctuating level after 1630.

Feathers.

In 1627 feathers appears for the first time as a tithe payment (cf. Figure 14), and reach a high level in 1629 and 1630. In both years the feather payments come from Suderøe, and compared with Figure 13 it becomes clear that these were two extremely poor fishing years. An obvious reason for this conversion from fish to feathers could be to retain as much as possible of the scarce supplies of fish as food. The same seems to be the explanation in the other years.

Good, bad and catastrophic climatic conditions.

Elsewhere (Guttesen 1999:80), this author has advanced the hypothesis that food products from cows and sheep were by far the most important components of foodstuffs in traditional Faeroese agriculturally based society. Amongst these, milk from the cows was more important and more of a staple than mutton and tallow from the sheep. These food components amounted to 60-80 % of calorific consumption, supplemented with locally grown as well as imported grain, birds and whales. Except for grain, these were either only of local importance or were markedly varying in this yield. Fishing was important in most villages, but was subjected to considerable fluctuation in productivity

If we take the butter tithe and compare it with the variation in the wool tithe to determine any coincidences of good and bad years, we get a picture as in Figure 15. Good years in both series tend to agglomerate in the upper right corner and the bad years in the lower left. The points are connected where continuous data exist, and selected years labeled so that it is possible, with reference to Figures 2 and 6, to trace the course of events.

Subjectively, but with the benefit of historical records discussed below, the author has divided the information in Figure 15 into four classes: Catastrophic years with 5 incidents, Bad years 6 incidents, Normal years 21 incidents and Good years 5 incidents. Outside this grouping are two incidents. These designations cover climatic situations, but these are not simple. It could be cold summers with low productions of grass or bad and prolonged winters, as discussed in detail in Guttesen (2003).

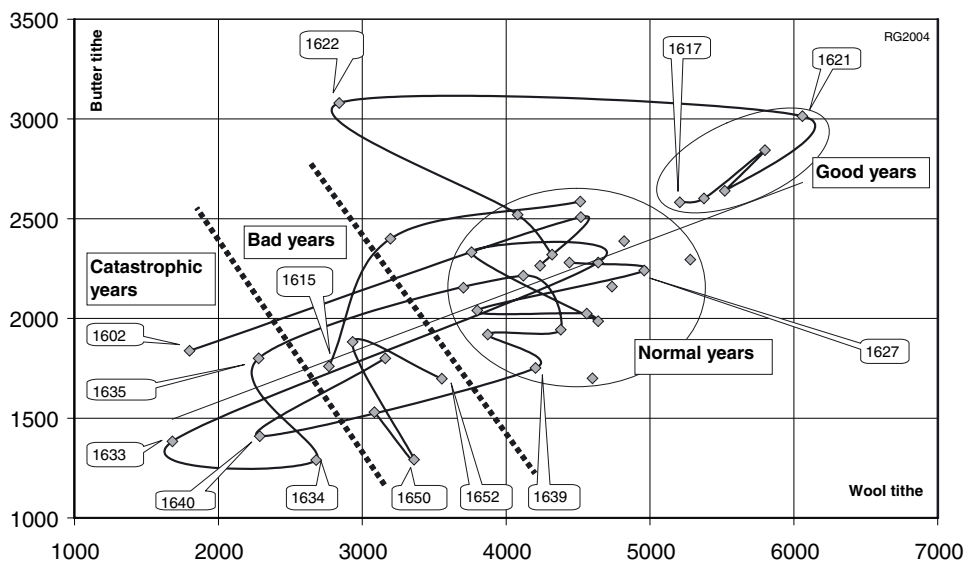


Figure 15: Variation in butter tithe against wool tithe, tentatively showing bad and good years, 1584-1652.

What other sources tell us about the situation in the catastrophic years.

1602 is traditionally known as a year with a severe winter with the so-called "Great Chandlemas Storm", which is discussed in Guttesen (1992). Zachariassen (1961:72) cites a letter from the King dated 17th April 1603, saying "how most of the livestock, both cows, pigs, sheep and lamb... in the bygone hard winter demised". The "bygone winter" without doubt refers to the winter 1601-02, so this document corroborates the information from the tithe accounts.

1633-35 are three consecutive years with meagre results, and they follow bad fishing years in 1629-31. The unsuccessful fishery is registered and described in the Minute book, *Tingsbókin*, for these years, Joensen (1953). In 1632 the Minute book says that "in the bygone winter many sheep were lost". Figure 15 classifies the year 1632 as a normal year.

For 1633, perhaps the worst year in Figure 15, the Minute book tells us that "most of the sheep have died, as well as several hundred cows". It continues to report that the grain harvest failed in the previous autumn which indicates that the summer was cold, grass growth was at a minimum, and winter fodder was sparse so the number of cows had probably been reduced before the winter had set in. But the winter turned out to be longer than foreseen, and further cows died. Since Shrovetide, in February the storage houses at the trading company were empty of grain and flour supplies.

In 1634 there are no references to the conditions of cows and sheep, but the serious situation might be inferred

from the note, that there had been a shortage of grain and flour in the storage houses.

In 1635 there are no references to sheep and cows and no complaints about the supplies. On the contrary, the Minute book talks about "all good things of life" in the storage house. One explanation of this apparent contradiction can be that 1635 was, compared to previous years, a good fishing year. The previous bad years may also have had the result that the Trading Company imported more goods to be safe.

In 1640 the Minute Book does not mention any complaints about the supplies in the storage houses, and nothing is mentioned about weather conditions. But the preceding year 1639 was marked by bad weather, so that it was impossible to fish during the spring and early summer. This weather situation may have resulted in a short growing season and therefore a shortage of hay. But generally the Minute Book records in the 1640s are scantier.

Additionally, a few comments will be made about the good years 1617-1621. No complaints are found in the Minute Book over the provisions. The supplies in the storage houses at the Trading Company are said to be good, and no bad weather situations are registered. And this is also the case in 1622, when Figure 6 shows a considerable decrease in the wool tithe. But, as Figure 10 shows, this is by far the best fishing year, so the marked changes could have at least two possible explanations. The decrease in the wool tithe could be caused by a real fall in the number of sheep slaughtered that year, or perhaps decrease is a consequence of accountancy whereby wool is substituted by fish.

Food from land and sea seen together.

When we include the result of the hunting trade, or fishing, into a composite picture of the nutritional situation, we obtain Figure 16. First of all, it is evident that the "good years" in agricultural production, shown in Figure 15, become even more abundant when fishing is added to the picture. It is easy to follow the line segment 1617 to 1624. On the other hand, the worst years are 1629-1630 and 1640 which were exactly those when the southern island paid a tithe feather instead of fish. The situation in 1652 is bad because of inferior fishing, but in this case feathers do not substitute for fish to any degree. 1633-1634 are again bad years, and 1602, the year with the "Great Chandlemass Storm", also lies at the end of the scale with serious shortages of foodstuff causing widespread hunger.

How many people?

The intention, at the start of this study, was to end up with an estimate of the population in the first half of the 17th century based on the tithe payments in both butter and wool. Using the proportions between population, cows and sheep that can be calculated from the comprehensive material contained in the Loebner Tables (FLS-a), presented and analyzed in Guttesen (1999a), it should be possible to make this estimate. But, as became apparent in this study, the wool tithe accounts involve too many unsolved questions, so that the calculation based on wool has been abandoned.

The situation in 1813, covered by Loebner, is assumed to be structurally about the same as in the beginning of the 17th century, covered by the oldest tithe accounts. Basic

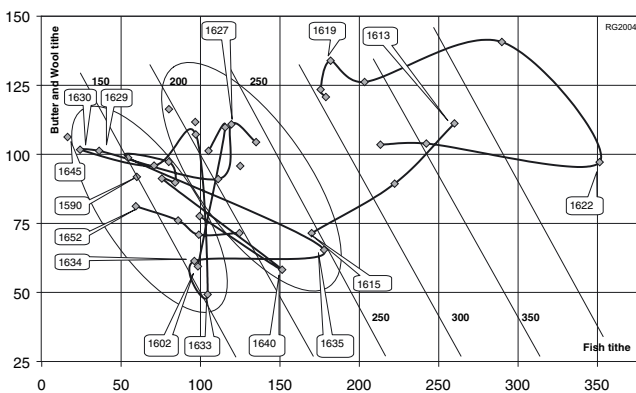


Figure 16: Variation in butter and wool tithe against fish tithe, tentatively showing bad and good years of provisions (food) for the inhabitants, 1584-1652.

Table 6: Basic proportions in 1813

Item	Number or calculation	Basic Proportion	Rounded
Population	5247		
Cows	2297		
Sheep slaughter.	28100		
Pop./cow	5247/2297	2.28	2 : 1
Pop./sheep	5247/28100	0.19	0.2 : 1
Sheep/cow	28100/2297	9.62	10 : 1

proportions can be derived from those tables, and these are shown in Table 6.

In the conversion from the butter tithe to the size of population, the trend in Figure 2 is used as well the results in Table 2. The figure shows that the King's butter tithe in 1600 and 1650 can approximately be set to 2250 and 1750 marks respectively. Because of the seven tithe-free vicarages, about 100 persons have to be added to these numbers. But the result gives an unexpected population size: From 1600 to 1650 it seems to fall from around 3200 to 2500.

Two other population estimates from the same period can serve as comparisons. Andersen (1895/1961: 37) has, based on the assumption of an average household of 9 persons and from a number of tax accounts, estimated the population in 1614 to be 4300. Mortensen (1954:37) based his estimate on the number of tax accounts in the cadastre for 1584 and an average household of 5 people. This gives a total of 2180 people. Then the number of male and female servants is estimated to be 3 for each Mark of land. The total of Mark land is 2400, so there must have been 800 servants. This number is then rounded up to 1000, to include old and disabled people. Consequently the number has been (2180+800+200) or 3180 "about the year 1600" as Mortensen says. This is the same order of magnitude as found in the present analysis, but what is new is that the population is decreasing so much, to only 2500 people.

As mentioned, the possibility of using the wool tithe in the same way has been abandoned. But if we use the proportion in Table 6, we should expect 10 sheep to be slaughtered for every cow. In 1600 it would be 13,500 sheep. Using the raw conversion proportions in Table 4, the number of sheep for slaughter the same year would be (4.44 x 5,000) or 22,200 which I estimate to be much too high. It would give, using the basic proportions in Table 6,

1 mark of King's butter tithe =	0.60 cows	2.3 inhab. for each cow
1600 gave 2250 marks	1350 cows, or	3105 inhabitants
1650 gave 1750 marks	1050 cows, or	2415 inhabitants

Table 7: Conversion from butter to people for 1600 and 1650

a population of 4400. Further, if we from this number of sheep calculate the basic proportion between sheep and cows it would give 16:1 instead of the expected 10:1 which is calculated from the Loebner Tables (FLS-a). This further underlines that the wool tithe accounts must be analyzed in more detail to understand and interpret them correctly. This is reminiscent of the saying by Alvin Toffler: "The right question is usually more important than the right answer to the wrong question" (reference unknown).

Conclusions

This study has produced some new results, but at the same time highlights at more problems which are not yet solved. One result is the low and falling size of the population, from 3,200 to 2,500 in the first half of the 17th century. A number of years (cf. Figure 16) 1590, 1602, 1629-30, 1633-34, 1645 and 1652, can be characterized as famine years; these 8 years constitute 20 % of the data-series. They are closely followed by 9-10 other meagre years. On the other hand, a period from 1617 to 1624 must be characterized as years of plenty, mostly because of good fishing. If we deal with the agricultural products separately (cf. Figure 15) the weather conditions were catastrophic in 1602, 1633-34-35, and in 1640; or in 13% of the years, followed by 6 bad years. Especially good years occur in the five-year period 1617-21. The trend for both cows and sheep is falling through the period, indicating deteriorating climatic conditions. The tithe for butter, wool and stockfish, representing the number of cows and sheep slaughtered and fishing, exhibits different degrees of fluctuation between good and bad years in ratios of 2:1, 3:1 and 10:1.

Some new unsolved problems appeared during the study. Why does the payment of butter tithe tend to agglomerate on certain values, especially for Suderøe, Sandøe and Norderøe? Why does grain not appear in the King's accounts when two authors say that it was divided into four parts, and the priests had their share? How many sheep were reared on Suderøe and Sandøe, the question arises as these two districts did not or only partly paid a wool tithe.

There are two promising perspectives for the further work with the historic-geographic data from the Faeroe Islands. One is the continuation of the analyses of the tithe accounts that, after a lacuna from 1653 to 1708, are available again from 1709 and onwards. These analyses could be brought in connection with attempts to reconstruct the population development based on studies of the church records (Garði 1980). The other is to bring more attention to the material base of the society and the natural environment when the history of the 17th and 18th century is interpreted.

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