



Jones, E. T. (2017). *Tonnage estimates of goods recorded in the Bristol 'particular' customs accounts: 1465/6, 1485/6, 1503/4.*

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Evan T. Jones, 'Tonnage estimates of goods recorded in the Bristol 'particular' customs accounts: 1465/6, 1485/6, 1503/4'¹

The 'particular' customs accounts of the Exchequer record England's late medieval and early modern trade in great detail. Where they survive, they indicate every item of merchandise that was imported or exported from an official port. The accounts for Bristol typically record: the name of the ship, its home port, the place the ship was sailing to / from, the date of entry or exit and the name of the shipmaster. Below this are the name of each merchant that had goods on the ship and the quantity of each item of merchandise they owned. Where goods were subject to the *ad valorem* duty of 'poundage', the official value is recorded, presumably based on a 'Book of Rates' kept by the port's customs officers.² Where goods were subject only to 'specific' duties, as was the case with broadcloth and wine, only the duty paid is recorded.

The value of the 'particular' accounts for studying England's overseas trade has long been recognised. The first studies of Bristol's late medieval trade to make heavy use of the accounts were published in the 1920s and 1930s.³ Much less use has been made of them for studying shipping and the shipping market, however. In part that is because a detailed study of the shipping industry requires estimates to be made of the tonnages shipped. This is crucial to understanding the market because, for ship-owners, the tonnage of cargo carried was more important than its value. That is because freight charges, then as now, were dependent primarily on the volume of goods shipped and the distance carried.

By the late Middle Ages, the ton of shipping capacity in England had become established as the long-ton of 2,240 lbs. or 40 cubic foot of shipping capacity.⁴ This was based on the size of one tun (or cask) of Bordeaux wine, which was the most important good shipped into England, both in terms of value and the quantity shipped. Gascon wine was so important to the shipping industry that the size of English merchant ships was expressed in terms of the number of tuns of wine, by Bordeaux measure, they could carry. This was the 'portage' of the vessel, or its size in 'tons burden'. So, a ship of '150 tons burden' was one that could carry 150 Bordeaux 'tuns' of wine in its hold.

¹ This paper explains the workings that underpin my analysis in: Evan T. Jones, 'The shipping industry of the Severn Sea' in E. T. Jones and R. Stone (eds.), *The World of the Newport Medieval Ship: trade, politics and shipping in the mid-fifteenth century* (University of Wales Press, forthcoming). The research was undertaken with the support of The Cabot Project (University of Bristol), funded by Gretchen Bauta, a private Canadian benefactor. I am also grateful for the support offered by: The Friends of the Newport Ship, Newport City Council, and University of Wales Trinity Saint David.

² The earliest surviving Book of Rates is from 1507. Gras suggests that although this was 'probably not the first' such book, they were likely to have been an 'invention' of the early sixteenth century: N. S. B. Gras, *The Early English Customs System* (OUP, 1918), p. 123. T. S. Willan observes that, while earlier books *could* have existed 'no actual Book of Rates seems to have survived for the medieval period.': T. S. Willan (ed.), *A Tudor Book of Rates* (Manchester, 1962), p. xx. Although no earlier books have been identified, their existence at Bristol can be *inferred* from the valuations of the port's early 'particular' customs accounts, a large number of which survive for the period, 1461-1504. These display remarkable uniformity in the valuation of goods within any one account and, in many cases, across the decades. Given that the market value of any commodity would have varied, such uniformity implies that the officers were working from a Book of Rates to determine what value they should assign to a dozen calfskins, a ton of salt, or a hogshead of vinegar. With unusual goods, the officers probably relied on valuations proposed by the owner and/or other merchants. This might explain why the valuations of rare commodities are much less standardised.

³ A. K. Longfield, *Anglo-Irish Trade in the Sixteenth Century* (London, 1929); E. M. Carus Wilson, 'The overseas trade of Bristol' in E. Power & M.M. Postan (eds.), *Studies in English Trade in the Fifteenth Century* (London, 1933); E. M. Carus-Wilson (ed.), *The Overseas Trade of Bristol in the Later Middle Ages* (Bristol Record Society Publications, Vol. VII, Bristol, 1937).

⁴ F. C. Lane, 'Tonnages, Medieval and Modern', *Economic History Review*, XVII (1964), pp. 219-20.

A Bordeaux tun held 252 gallons (2,016 pints) of wine, which weighed about 2,240 lbs., once the weight of the cask was included. The English / Imperial 'ton' weight (2,240 lbs) derives from this. Yet, for shippers, the volume of goods could be as important as the weight, particularly if the goods were light but bulky. That was because a full lading would weigh much less than the tonnage capacity of the ship. This led to the development of the notional 'freight ton', which was used to determine the freight charges on light goods. The freight ton was considered to be roughly 40 cubic foot – that being the space one tun of wine would take up, once allowance was made for space lost around the casks and for dunnage and other materials used to secure the cask in place. In practice, goods that were denser than wine (e.g. iron), or of a similar density (e.g. olive oil, woad or salt) paid freight according to their weight. Goods that were significantly less dense (e.g. cork or feathers) paid freight according to their volume.

In my chapter 'The shipping industry of the Severn Sea' in *The World of the Newport Medieval Ship*, I produce figures for the number of tons shipped to and from Bristol in three accounting years: 1465/6, 1485/6 and 1503/4.⁵ The chapter considers both the commodities shipped and the places those goods went. To produce these tonnage figures it was necessary to convert the information in the 'particular' customs accounts relating to the *quantity* of goods shipped, into tonnage figures. In many cases this is easy, since the customs accounts record the quantity in tons, or using units that can readily be converted into tons: such as the pipe (2 pipes wine = 1 ton), or the hundredweight (20 cwt. = 1 ton). Indeed, the great bulk of the cargo shipped during this period consisted of items recorded in such ways. This includes wine, olive oil, salt, woad and iron. On the other hand, not all goods were recorded in this manner: woollen broadcloth, for example, was recorded by the piece, while pickled white herring was recorded in barrels. If tonnages shipped are to be calculated, it is thus necessary to produce estimates of how much such goods would weigh, or, in the case of bulky goods, such as cloth, how much shipping space a woollen broadcloth (typically recorded in the accounts as what we describe as a 'cloth of assize') would consume. While this might sound a difficult task, it is not insurmountable, because many goods were of standard sizes, with their weight or volume stipulated by law. And although this is not true of all commodities, those items where this does not apply either appear very infrequently, or were small / lightweight by nature. That means that, by any reasonable estimation, they would only have accounted for a tiny proportion of the goods shipped in a year. So, even if mistakes have been made in calculating the tonnage of a pound of saffron, a dozen thimbles, or a thousand nails, such errors will have very little impact on an analysis of the port's overall shipping market.⁶

The paper below concerns only those goods transported by ships trading through Bristol in the accounts covering: 1 October 1465 - 14 May 1466, 29 September 1485 - 28 September 1486, and 29 September 1503 - 28 September 1504. The transcriptions of these have been, or will be published online as EXCEL files. Although the list is a long one, most of the items detailed below are only mentioned a few times. As such, they were responsible for a minute proportion of Bristol's overseas trade, both in terms of value and tonnage. The great majority of the port's overseas trade consisted of a small number of items imported or exported in very large

⁵ Evan T. Jones, 'The shipping industry of the Severn Sea' in E. T. Jones and R. Stone (eds.), *The World of the Newport Medieval Ship: trade, politics and shipping in the mid-fifteenth century* (University of Wales Press, forthcoming).

⁶ If the reader intends to use the tonnage estimates in this paper for examining other periods or places, it is worth recalling that items that were unusual at this time may have been major trade items in other periods or ports. So inaccuracies that would have very little import for the sake of the present chapter might be more significant in other contexts. This should be borne in mind, with the estimates here being treated as a 'starting point' for research, rather than as a definitive statement.

quantities. This is apparent from the six tables at the end of this paper, which list *every* commodity listed during the three years and the estimated total tonnage imported and exported in each period.

The descriptions are laid out as follows:

- Commodity name (*name as it appears in the customs accounts, usually in Latin*), followed by commodity units used in the accounts.
- Discussion of the item, how frequently it appears in the accounts, the valuations applied and the way the estimate of freight tonnage was arrived at.
- Tonnage per unit, as applied for the analysis.

The final part of this paper consists of six tables that list all the goods shipped on these three years and the estimate of the total tonnage shipped for each commodity.

Alabaster, Tables of (*tables de Alabaster*) – piece

An unusual export, which only appears twice, both times in the 1485/6 account. On one occasion two ‘tables’ are valued at 40s., on the other occasion one ‘tabull’ is valued 13s. 4d. The entries almost certainly refer to the export of ‘Nottinghamshire alabasters’. These were alabaster ‘tables’ (i.e. carved stone tablets / plaques) that were often assembled to form an altarpiece. The Swansea Altarpiece at the V&A, which is good example of the type, weighs 80kg (176 lbs.).⁷ It has five full-sized tablets and two half size ones, implying each tablet weighs about 30 lbs. The form of the Bristol references seems to suggest that individual tablets were being referred to. Since these were precious and quite fragile, they would have required careful packing. It has thus been assumed that each tablet consumed 2 cubic foot of shipping space.

Unit: 1 ‘piece’ = 0.05 freight tons

Almonds (*almonds*) – C

Just three entries, recorded as imports from Andalusia in 1503/4. In the 1507 Book of Rates, ‘Allmondes’ are recorded by the ‘c wayte’ (hundredweight).⁸ It is thus assumed that the ‘C’ refers to a ‘hundred’ pounds: probably the ‘long hundred’ of 120 lbs. in this case.

Unit: 1 C = 0.05 freight tons

Alum (*alam*) - C / quarter / lb.

A valuable mineral salt used as a mordant in the dyeing industry. Nearly all the alum listed in the three accounts relates to a single entry of 4,000 C imported from Pisa on the ‘Olyuer of Galwey’ on 16 November 1485.

Unit: 1 C = 0.05 freight tons, quarter [C] = 0.0125 freight tons, lb. = 0.0004 freight tons

Aniseed (*annes / annes sede*) – qr. / doz / lb.

Recorded as an occasional export to Ireland in 1503/4. Listed by the quarter ‘C’ (30 lbs), dozen (12 lb.), or lb.

Unit: 1 quarter = 0.0125 freight tons, 1 dozen = 0.00536 freight tons, 1 lb. = 0.0004 freight tons

Ashes, Lye (*ashes de lies*) – hogshead

A wood ash used for making soap, recorded as a single import from Bordeaux in 1504.

Unit: 1 hogshead = 0.25 freight tons

Bacon (*bakon*) – flitch (*flege*)

Recorded in four entries in 1503/4, as exports to Ireland, France and Spain. A flitch is a salted and cured side of bacon. On a modern pig, weighing c.250 lbs, the side would weigh 23 lbs. (for two).⁹ So each side would be c.11 lbs. Medieval pigs were typically smaller, so it has been assumed that 1 flitch weighed 6 lb.

Unit: 1 flitch = 0.0025 freight tons

Battery (*batrie*) – C / lb.

‘Battery’ are copper or brass articles, such as pans or cups, wrought by hammering. Recorded ten times as an export to Ireland in 1503/4 and occasionally before that. Determining how much freight space a C of battery would have taken up is very difficult, since it would have depended

⁷ <http://collections.vam.ac.uk/item/O70204/the-swanssea-altarpiece-altarpiece-unknown/>. Accessed: 25 April 2017.

⁸ Gras, *Early English Customs System*, p. 695.

⁹ <http://www.oda.state.ok.us/food/fs-hogweight.pdf>. Accessed 24 April 2017.

on the form of the brassware. So, as with 'Pewter' (see below), it has been assumed that the freight was based on the weight.

Unit: 1 C = 0.05 freight tons, lb. = 0.0004 freight tons

Beans (*fabar'*) – wey, quarter (1 wey = 6 quarters = 48 bushels = 3072 pints)

Beans were exported in considerable quantities to Ireland in 1485/6 and 1503/4. They were cheap, relative to their weight, valued at 13s. 4d. per wey. Contemporary estimates suggest that 5 quarters of grain were equivalent to one tun of Bordeaux wine for shipping purposes.¹⁰ In some cases the customs accounts list mixed consignments, such as: 'Beans and Barley', 'Beans and Malt', 'Beans and Peas' or 'Beans, Barley and Malt'. In these instances, the same freight tonnage assumptions are made as for 'Beans'.

Unit: 1 wey = 1.2 freight tons, 1 quarter = 0.2 freight tons

Beer (*beere, bere*) – last / barrel

Valued in the 1503/4 account at 1s. 3d. per barrel *or* 30s. per last. This implies 1 last = 24 barrels. All the entries that year relate to voyages to Ireland. In 1465/6 beer had been valued at 26s. 8d. per last in a single consignment dispatched to Iceland. The 'Common Place Books' suggest a beer barrel contains 36 gallons (288 pints), with the wooden cask itself weighing 26 lb.¹¹ It is thus assumed that 1 barrel weighed an eighth of a ton.

Unit: 1 last = 3 freight tons, 1 barrel = 0.125 freight tons

Bice (*bise*) – lb.

A pigment used in the dyeing industry. There is a single entry to 'bise' imported 1503/4.

Unit: 1 lb. = 0.0004 freight tons

Bonnets (*bonettes*) – dozen

Valued at 6s. 8d. per dozen in 1465/6 for a voyage to Ireland. Estimated a dozen bonnets took up 0.2 cubic foot.

Unit: 1 doz = 0.005 freight tons

Bows (*ars'*) – dozen

Just one entry to the export of 3.5 dozen 'ars' to Ireland in 1465. Assuming these are bows, the same estimates have been applied as for bowstaves (see below).

Unit: 1 doz = 0.04 freight tons

Bowstaves (*bowstaves*) – C

A total of 7.833 C (940) bowstaves were imported in 1486 from Pisa, Bordeaux and Madeira, perhaps representing a high demand for longbows following the accession of Henry VII the previous year. If a bowstave was 2 metres long and 4cm across, then 1 bowstave = 0.0032 cubic metres. So, 1 C (120) bowstaves = 0.384 cubic metres (0.34 freight tons). This tallies with medieval estimates that 6 C bowstaves make a ship last, which was roughly 2 freight tons.¹²

Unit: 1 C = 0.34 freight tons

¹⁰ D. Burwash, *English Merchant Shipping 1460-1540*, p. 94.

¹¹ Hubert Hall and Frieda J. Nicholas, 'Select tracts and table books relating to English weights and measures (1100-1742)', *Camden miscellany*; v. 15 [no. 5] (1929), p. 22.

¹² Hall and Nicholas, 'Select tracts', p. 19. For a more accurate and complete transcription of 'The Noubre of Weyghtes', see: Stuart Jenks, 'Werkzeug des spitmittelalterlichen Kaufmanns: Hansen und Engländer im Wandel von mem-oria zur Akte (mit einer Edition von The Noubre of Weyghtys)' in *Jahrbuch für friinkische Landesforschung*, Bd lii (1992).

<http://daten.digitale-sammlungen.de/~db/0004/bsb00048842/images/index.html?fip=193.174.98.30&seite=300&pdfseite=>

Boxstaves (*box staves*) – C

Recorded in a single entry coming from northern Spain in 1504. It presumably refers to pieces of boxwood, which were used for carving. It seems likely 'C' relates to number rather than a weight. In the absence of more information, it has been assumed that 120 boxstaves occupied the same volume as 120 bowstaves.

Unit: 1 C = 0.34 freight tons

Butter (*butiri*) – barrel

Valued 8s. 4d. per barrel in 1465/6 on voyage to Iceland.

Unit: 1 barrel = 0.125 freight tons

Calx (*calces*) – ton

A chemical residue produced by burning a substance. In this instance, it probably refers to quicklime, which is made by burning limestone. It only appears in the 1503/4 customs account when a total of 58.5 tons was exported to Britany by alien merchants.

Unit: 1 ton = 1 freight ton

Caps (*peleores*) – dozen

While not appearing earlier, woollen caps had become a relatively common export to Ireland by 1503/4 and would more common later in the sixteenth century. A total of 414 caps were dispatched in 1503/4. Estimated a dozen caps took up 0.2 cubic foot, as with bonnets.

Unit: 1 dozen = 0.005 freight tons

Cards, unspecified (*cardes*) – dozen / pair

In 1503/4 a total of 4 dozen 'cards' and 12 pair of 'cards' were exported to Ireland, valued at 4s. or 5s. per dozen or 4d. per pair. These were presumably wool-cards, used for carding wool, prior to spinning. These would be light-weight but bulky, so it has been assumed that a dozen occupied 4 cubic foot.

Unit: 1 doz = 0.1 freight tons

Check Cloth (see **Cloth, Check**)**Cinnamon** (*sinamon*, *canell*) – lb.

Some 60 lbs. of 'cannell' (an inferior grade of cinnamon) was imported in a shipment from the Levant in 1486 valued 1s. 6d. per lb, while 49 lbs. 'sinamon' was imported from Lisbon and Andalusia in 1503/4 valued 2s. 6d. per lb. The same year, a total of 5 lb. of 'sinamon' was exported from Bristol to Ireland, valued 2s. 6d. per lb. In the 1558 Book of Rates, 'sinamon' is valued at 4s. per lb.¹³

Unit: 1 lb. = 0.0004 freight tons

Cloth, Camlet (*chamelet*) – piece

This was a costly Eastern fabric, made from a mixture of silk and wool / camel hair. It appears only in the 1485/6 customs accounts, in two unusual shipments coming from Pisa and the Levant. It was valued variously at 10s., 13s. 4d. and 15s. per piece, suggesting that the customs officers had no official valuation for the cloth, so relied on declarations by the merchants to rate the cloth. The 1507 Book of Rates valued 'chamlett' at 13s. 4d. per piece. The 1558 Book of Rates values 'Chamlets the double peece containing xx yardes' at 40s., which is twice the

¹³ Willan, *Tudor Book of Rates*, p. 55.

value of the piece.¹⁴ This suggests a piece was 10 yards long. It has been assumed that the cloth was half the weight per square yard of broadcloth (i.e. 0.72 lbs. per square yard), with the same x 3 multiplier applied for the freight space (see 'cloth of assize' below).

Unit: 1 piece = 0.009 freight tons

Cloth, Canvas (*canvas*) – bolt

A total of 6 bolts of Breton Canvas was imported in 1503/4 on a vessel from St Ives, said to be coming from Ireland. Valued at 6s. 8d per bolt. Assumed 1 bolt occupied 2 cubic foot.

Unit: 1 bolt = 0.05 freight tons

Cloth, Check (*chek, chekers*) – C / yard

An Irish woollen cloth, named after its patterning, that appears frequently as an import in the Bristol customs accounts in 1503/4. It is recorded by the yard or the C (120 yards), valued at 4d. per yard. This suggests it was a cheap cloth, like 'frieze'. It was assumed it was a third of the weight per square yard as broadcloth (i.e. 0.48 lbs. per square yard), similar to worsted (see below). It seems likely it was a 'strait' (narrow) cloth, roughly 1 yard wide. The same x3 multiplier was applied for freight space, as with other cloths.

Unit: 1 C = 0.072 freight ton, 1 yard = 0.0006 freight tons

Cloth, Fustian (*Fustian*) – piece

A single export to Ireland in 1503/4 of one piece of fustian valued 5s. This was a fairly course cloth usually made from a mixture of linen and cotton, although it also sometimes refers to a woollen or part-woollen cloth. For present purposes, it has been assumed that it was about the same size and weight as 60 yards of Irish Check Cloth (see above), which had the same valuation (5s.).

Unit: 1 piece = 0.036 freight tons.

Cloth, Frieze (*frise*) – yard

In 1503/4 there are three references to the import of Frieze from Ireland, valued 4d. per yard. This is the same valuation applied to Irish Check Cloth (see above). The same tonnage assumptions are made as for Check.

Unit: 1 yard = 0.0006 freight tons

Cloth, Breton linen (*pan' linen Britan'*) – C

An occasional import item in 1503/4, valued 20s. per C (120 yards) or 2d. per yard. This is twice the value of Irish linen. The same freight space assumptions were adopted as for 'Cloth, Irish linen' (below)

Unit: 1 C = 0.054 freight ton, 1 yard = 0.00045 freight tons

Cloth, Irish linen (*pan' linen Hibernia*) – C / quarter / yard

Irish linen (also sometimes just described as 'linen' on ships from Ireland), is a common import in all three accounts. It is normally recorded by the C of 120 yards, valued at 1d. per yard. Occasionally it is recorded by the 'quarter' (30 yards) or the yard. It has been assumed it had about the same fabric weight of modern Irish linen (c.175g per square metre), making it about a quarter of the weight of a cloth of assize. The same x3 multiplier has been applied to estimate the freight space it would have taken up used for other cloth. This implies 1 square yard = 0.36 lbs. and took up 0.018 cubic foot (i.e. 31 cubic inches).

Unit: 1 C = 0.054 freight ton, 1 quarter = 0.135 freight tons, 1 yard = 0.00045 freight tons

¹⁴ Willan, *Tudor Book of Rates*, p. 16.

Cloth, Satin and Damask (*satens & damaskes*) – yard

There is a single reference to the import of 70 yards of satins and damasks from Pisa in 1485, valued at £17 6s. 8d. For current purposes, it has been assumed that it weighed about a quarter of the weight of a cloth of assize (0.36 lbs. per square yard). This is the same estimate applied to Irish linen. The same x3 multiplier has been applied for freight space calculations used with other cloth.

Unit: 1 yard = 0.00045 freight tons

Cloth, Wadmál (*wodmoll*) – piece

Two references in the 1485/6 account to the import of 19 of these cloths from Iceland, valued 4s. per piece. Wadmál was a coarse, dense and usually undyed woollen cloth designed for northern climes. While qualities and sizes varied, a typical piece was about 3 yards long and 1 yard wide.¹⁵ Assuming it was the same weight per square yard as a cloth of assize (1.43 lbs. per square yard) a piece would weigh 4.29 lbs. The same x3 multiplier has been applied for freight space calculations used with other cloth.

Unit: 1 piece = 0.0054 freight tons

Cloth, Woollen - Cloth of Assize (*pann' sine grano*) – piece

Most of Bristol's cloth trade consisted of the export of English woollen cloth of the 'broadcloth' type. This was a fine, expensive and heavyweight cloth, that had been soaked, shrunk and fulling (pounded with wooden hammers) following weaving to produce a felted fabric. The fabric weight was roughly equivalent to that found today in Melton wool cloth, used for heavy winter coats and dress uniforms.¹⁶ Since English broadcloth took many shapes and forms, the customs officers recorded the cloths they received as what are sometimes called 'customs cloths' and are here described as 'cloths of assize'. This meant that a mixed consignment of cloths of different sizes could be 'translated' into notional cloths of assize for customs purposes. Such cloths paid the ancient custom of 14d. for each cloth exported by indigenous merchants. Cloths of assize were normally described as '*pann' sine grano*' (i.e. cloth dyed without grain).¹⁷ 'Although it was normal for customs officers to record cloth purely in terms of notional cloths of assize, they sometimes chose to record broadcloth type cloth as 'dozens' and 'straits'. 'Dozens' were half the length of a full cloth (i.e. 12 yards), 'straits' were half the width.

The Bristol customs accounts indicate that the cloth of assize was 24 yards long. This tallies with the figures given in the *Noumbre of Weyghts*, which notes that a finished broadcloth was 24 yards long and 2 yards wide, although most seem to have been slightly narrower than this (typically 1.75 yards) wide in practice after fulling. The weight of such a cloth can be determined from the 1551 'Acte for the makinge of wollen clothe'.¹⁸ The 'short cloths' mentioned in the Act' of c.24-25 yards were meant to weigh between 56 and 60 lbs. This works out at 1.43 lbs. per square yard.

¹⁵ Marta Hoffmann, 'Clothmaking' in Philip Pulsiano (ed.), *Medieval Scandinavia: An Encyclopedia* (1993), p. 99.

¹⁶ Modern melton wool cloth typically weighs 650-700g per square metre. The weight of medieval Essex broadcloth has been estimated to be 783g per square metre (i.e. 1.44 lbs. per square yard): John Munro, 'Three centuries of luxury textile consumption in the Low Countries and England, 1330-1570: trends and comparisons of real values of woollen broadcloths (then and now)', in Katharine Vestergård Pederson and Marie-Louise B. Nosch, *The Medieval Broadcloth: Changing Trends in Fashions Manufacturing and Consumption* (Oxbow Books, 2009), p. 9.

¹⁷ 'Grain' in this context was kermes, an expensive dyestuff used to produce scarlet cloth. 'Scarlet' had to be distinguished by the customs officer from other coloured broadcloth because it paid double the customs duty.

¹⁸ *Statutes of the Realm*, Vol. IV, i, (London, 1819), pp. 136-7.

Although broadcloth was a heavyweight fabric, it was less dense than water. To date, it has not been possible to identify contemporary calculations for how many woollen cloths made up a freight ton. Although there are records of freight charges on cloth, contemporary freight rates were based on packs or fardels of cloth – a pack typically consisting of ten cloths. No contemporary attempts to convert this into a freight ton have been identified.¹⁹ On the other hand, it may be noted that before the introduction of bale-presses in the eighteenth century a ton-weight of raw cotton occupied three freight tons.²⁰ Similarly, a machine-pressed bale of raw wool today of 28 cubic foot, will weigh c.728 lbs, implying that 1 ton (2240 lbs) would occupy 86 cubic feet, or just over 2 freight tons. Although a fulled woollen cloth would be denser than raw wool, if it was packed too tightly the felted finish would be spoilt.²¹ Since this finish was a key indicator of quality, it can be assumed that merchants would have wished to avoid creasing or crushing the cloth by subjecting it extreme pressures. It has thus been assumed that one ton-weight of broadcloth occupied 3 freight tons. This would imply that a cloth of assize, weighing 60 lbs, occupied 3 cubic foot (0.075 freight tons). A roll of such cloth would be 1.75 yards (5.25 foot) wide, with a diameter of 10.25 inches.²²

Unit: 1 piece = 0.075 freight tons, 1 square yard = 0.00179 freight tons

Cloth, Woollen: Cloth of Assize, Dozen (*doz s' g'*) – piece

This was half the length of the standard cloth of assize, which was commonly described as a 'Dozen' because it was a dozen yards long.

Unit: 1 piece = 0.0375 freight tons

Cloth, Woollen: Cloth of Assize, Dozen Strait (*doz strait s' g'*) – piece

This was half the length and half the width of the standard cloth – a 'strait' / 'strait' being a narrow cloth.

Unit: 1 piece = 0.01875 freight tons

Cloth, Woollen, Cloth of Assize, Dozen Kersey – piece

Appears once on 5 November 1465 as an export to Bordeaux. The entry states that 30 Dozen Kersies contained 10 whole cloths. It paid custom as a cloth of assize, the duty of 11s. 8d. being the correct amount for this (14d. per cloth). Given this, it is assumed that each cloth took up one third of the freight space as a regular cloth of assize.

Unit: 1 piece = 0.025 freight tons

Cloth, Woollen, Welsh (*pan' wall'*) – piece

Welsh cloth is somewhat anomalous, in that it was sometimes treated as cloth paying custom, along with English broadcloth and sometimes treated as cloth paying poundage. When paying poundage, a full-sized 'Welsh cloth' was valued at £1 per cloth, while a 'Dozen Strait Welsh', which would have been a quarter of the size, was valued at 4s. 2d. per piece. This suggests that a regular full width and full length cloth was about the same size as a broadcloth (24 yards long by 1.75 yards wide). It may be that the issue of whether such cloth should be considered a 'broadcloth' did not seem to matter to the customs officers, since the poundage payable on a

¹⁹ Ralph Davis seems to have encountered a similar problem when working on the later English shipping industry, requiring him to produce his own estimates of tonnages of woollen and linen cloth: Ralph Davis, *The Rise of the English Shipping Industry in the Seventeenth and Eighteenth Centuries* (London, 1962), p. 182.

²⁰ Davis, *Rise of the English Shipping Industry*, p., 179.

²¹ I would like to thank Professor John Styles (University of Hertfordshire) for his thoughts on the packing of broadcloth.

²² If no allowance is made for wasted space in the packing, this would imply that the cloth was 0.095 inches (2.4 mm) thick. While this is thicker than the modern equivalent cloth, some allowance should be made for space lost in the folding or rolling of the cloth and for the wrapping and packing of it.

Welsh Cloth (12d.) was similar to the 14d. custom payable on a cloth of assize. It has been assumed here that a Welsh cloth weighed the same as a 'cloth of assize' and occupied the same space.

Unit: 1 piece = 0.075 freight tons

Cloth, Woollen, Dozen Strait Welsh (*doz. strait welsh*) – piece

The name suggests this was 12 yards long and half the width of a regular cloth. It is thus assumed it is was the same weight as a 'Dozen strait cloth' playing custom.

Unit: 1 piece = 0.01875 freight tons

Cloth, Woollen, Kersey – piece

Like Welsh cloth, Kersey was sometimes treated by the customs officers as cloth paying poundage and sometimes as cloth liable to the ancient custom levied on broadcloth. When it was treated as cloth paying 'custom', the customs officers reckoned three kerseys to a cloth of assize. On this basis, it is assumed that one piece was a third of the weight and size of a cloth of assize.

Unit: 1 piece = 0.025 freight tons

Cloth, Woollen: Worsted (*worsted*) - piece

On 26 April 1466, five pieces of 'worsted' were valued in Bristol at 24s. per piece. On 7 October 1485, 18 pieces, said to amount to 9 'whole pieces' (*pan' integr'*), were valued at 70s. or c. 7s. 9d., This seems an odd valuation and may perhaps be a mistake, or else was just based on the merchant's declaration of the value of what was at that time an unusual export for Bristol. Later in the sixteenth century worsteds became more common, typically being valued in the Bristol 'particular' accounts at £1 per piece. Worsted was much lighter-weight fabric than broadcloth, being about a third of the weight per square yard.²³ That would be 0.48 lbs. per square yard, a weight that roughly tallies with later-sixteenth century estimates of the amount of wool in each cloth.²⁴ While the form of worsted cloth is not specified in the fifteenth-century Bristol accounts, a 1442 statute to regulate worsted manufacture specified that the standard worsted cloth was 6 yards long and 2 wide.²⁵ Such a cloth would thus weigh 5.76 lbs. Applying the same x3 multiplier used for 'cloth of assize', a worsted would take-up 0.288 cubic foot (0.0072 freight tons).

Unit: 1 piece = 0.0072 freight tons

Coal (*carbon'*) – wey (4 weys = 1 last)

Eleven entries in the 1503/4 customs accounts, with a total of 99 weys exported to France, Britany and Ireland. Valued at 3s. 4d. per wey, the coal probably came from Bristol's own coalfields, which continued to be exploited until the early twentieth century. The wey of coal employed by the Bristol customs officers was roughly one ton.²⁶

Unit: 1 wey = 1 freight ton

Combs (*pect'*) – bale or M

²³ A late medieval pure worsted from the Low Countries weighed 360g per square metre, which was 33 percent of the weight of an Essex Broadcloth (782g per square metre): Munro, 'Three centuries of luxury textile consumption', p. 9.

²⁴ A 'Narrow Wosted', 15 yards long was said to contain 7 lb. of wool. John James, *History of the Worsted Manufacture in England* (London, 1857), p. 118. If the cloth was 1 yard wide, that would be 0.47 lbs. per square yard.

²⁵ Statutes of the Realm, Vol. II, p. 322.

²⁶ J. U. Nef, *The Rise of the British Coal Industry*, Vol. II (London, 1932), p. 373.

On 16 April 1486, a large consignment of 16 M combs imported from France was valued at 100s. (6s. 4d. per M, i.e. 1200 combs). The same account contains four other entries for combs, listed by the 'bale' at different valuations: 3s. 4d., 6s. 8d and 10s. per bale. The varying prices presumably reflected differing qualities or sizes. The 1558 'Book of Rates' has eleven different entries relating to combs or comb cases, emphasizing the diversity of forms.²⁷ At another point, the Book notes that 500 gross of combs (72,000) made a 'ton'. That would imply 1 M would be a sixtieth of a ton. Although the separate consignments of combs in 1485/6 may well have been of different sizes, it has been assumed for current purposes that a bale was about the same size as 1 M.

Unit: 1 bale = 0.01667 freight tons, 1 M = 0.01667 freight tons

Comfits (*conserve*) – barrel

The 1503/4 account contains a single entry for a barrel of conserve (rendered by the transcriber as comfits) from Andalusia, valued at 13s. 4d. Assumed this was a standard barrel.

Unit: 1 barrel = 0.125 freight tons

Compost (*compost*) – barrel

The 1485/6 account contains a single reference to the import of 8 barrels of 'compost' (preserved fruit) from the Levant, valued at £1 7s. 6d. per barrel. Assumed this was a standard wine barrel, with 8 barrels to the ton.

Unit: 1 barrel = 0.125 freight tons

Cord (*cord*) – C

In 1503/4, there is a single reference to the export of 2 C 'cord' to Ireland valued at 10s. per C. This was presumably some form of woven cord. It has been assumed the merchandise was valued by weight.

Unit = 0.05 freight tons

Cork (*corke*) - doz / C

Appears normally as an import from Portugal or an export (presumably re-export) to Ireland. It was assumed a 'doz' refers to 12 lb. and a 'C' to 120 lbs. Valued at 26s. 8d. the C in 1466. Since a ton of cork occupies the same space as 8-10 tons of water, a dozen lbs. would occupy 0.05 freight tons.²⁸ The 1507 Book of Rates, differentiates between 'Corke made in barrelles the last' valued at 20s. per last and 'Corke the bundelle for shypers' by the C (no valuation given).²⁹

Dozen = 0.05 freight tons, C = 0.5 freight tons

Cork, black (*corc' nigri'*) – piece / dozen

Valued in 1485/6 at 3d. per piece and in 1503/4 at 1s. 8d. per doz, in which form it appears ten times, coming from Spain or Portugal. The 1469 account records white cork (*corc alb'*) at £3 6s 8d. per ton, which would make it 4d. per dozen lbs. This implies a 'piece' of black cork was roughly 12 lb. Since a ton of cork occupies the same space as 8-10 tons of water, the piece (c.12 lbs.) was estimated to occupy 0.05 freight tons.³⁰

Unit: 1 piece = 0.05 freight tons, 1 dozen = 0.05 freight tons

Cork, red (*corc' rub'*) – stone

²⁷ T. S. Willan (ed.), *A Tudor Book of Rates* (Manchester, 1962), 18, 84-85.

²⁸ R. Davis, *The Rise of the English Shipping Industry* (Newton Abbot, 1962), p. 179.

²⁹ Gras, *Early English Customs System*, p. 696

³⁰ R. Davis, *The Rise of the English Shipping Industry* (Newton Abbot, 1962), p. 179.

A very unusual product, listed once in the 1503/4 account at 1s. per stone. Assumed the same shipping tonnage as 1 dozen black cork.

Unit: 1 stone = 0.05 freight tons.

Cork, white (*corc' albi'*) – C

A fairly unusual form of cork, it appears three times in the 1503/4 account, valued at 3s. 4d. per C. Assumed it occupies roughly 10 times the space relative to its weight, as with other forms of cork.

Unit: 1 C = 0.5 freight tons.

Cushions (*cushons*) – piece

In 1503/4, there is a single reference to the export of 12 cushions to Ireland. Assumed each cushion took up 0.5 cubic foot of space.

Unit = 0.0125 freight tons

Currants (*corans*) – barrel

The 1485/6 account records the import of 11 barrels of 'resens le corans' (raisins the currants) from Pisa, valued at 10s. per barrel. Assumed this was a standard wine barrel.

Unit: 1 barrel = 0.125 freight tons

Dates (*dats*) – barrel / C

The 1485/6 account records the import of 2 barrels and 1 'chest' of dates from the Levant, valued at 53s. 4d. for the complete consignment. Assumed a barrel is the same as a wine barrel. The 1503/4 account records the import of 2 C dates from Andalusia, valued 10s. per C. If a barrel contained 2.5 C, the valuations suggests that a chest of dates was 40 lbs. The 1507 Book of Rates, values 'Datys the c wyte' at 20s.³¹

Unit: 1 barrel = 0.125 freight tons, 1 C = 0.05 freight tons, 1 chest = 0.0167

Feathers (*fethers*) – C

On 30 May 1504, one-and-a-quarter C of 'fethers' was imported from Bayonne, valued 16s. 8d. By comparison, 'Fethers for beddes' are valued at 10s. per 'c wayte' in the 1507 Book of Rates.³² Since feathers are very bulky relative to their weight, it was assumed 1 C takes up 10 C (20 cubic foot) of shipping space.

Unit: 1 C = 0.5 freight tons

Fertes – M

On 22 December 1503, 8 M of 'fertes' was imported from Portugal, along with wine, fruit, marmalade, smigmatas, cork, oil and pepper. It was valued as 2s. 6d. per M. It has not been possible to identify this item. In the absence of better information, it has been assumed the 'M' refers to 10 cwt., making 1 M equivalent to 0.5 freight tons.

Unit: 1 M = 0.5 freight tons

Figs (*fyggs*) – ton / piece

In 1485/6 forty 'piece' of figs was imported from Italy valued at £3. The 'piece' was a measure, with later customs accounts indicating that 40 pieces of figs = 1 ton. The 1507 Book of Rates, values 'Fygges the tunne' at 40s.³³ This is the same value applied to one ton of fruit imported to Bristol (see below).

³¹ Gras, *Early English Customs System*, p. 697.

³² Gras, *Early English Customs System*, p. 697.

³³ Gras, *Early English Customs System*, p. 697.

Unit: 1 piece = 0.025 tons

Fish, Cropling – last

On 18 September 1486, 14.5 last of ‘cropelyng’ (an inferior type of stockfish) was imported from Iceland. Since stockfish (wind-dried cod) was typically transported loose, it seems likely that the last here was the ship last, with 1 last = 2 tons. The 1507 Book of Rates lists ‘Stocke fyshe callyd croopelyng’ by the last.³⁴ The 1558 Book of Rates notes that there were 10 C (i.e. 1200 fish) to the last.³⁵ This implies 1 C = 0.2 freight tons.

Unit: 1 last = 2 freight tons

Fish, Dogfish (*houndefish*) – C

In 1485/6, 2 C ‘houndfish’ (a name for a small shark often known today as ‘dogfish’) was imported from Ireland valued at 10s. per C. This is the same valuation applied to hake, which are of similar size and are a much more common type of fish in the accounts. When fish is listed by the ‘C’, this usually refers to the number of dried or salted fish, rather than a weight. Given this, it is assumed that 1 C of dogfish would have taken up about the same freight space as 1 C of Hake.

Unit: 1 C = 0.2 freight tons

Fish, eels (*anguill*) – barrel

An occasional import from Ireland, valued at 6s. 8d. per barrel. Assumed a standard wine barrel was involved. Since the cure is unknown and eels can be smoked, salted or pickled, it has been assumed the eels were freighted by volume.

Unit: 1 barrel = 0.125 freight tons

Fish, Gillfish (*gillfishe*) – last / C

On 18 September 1486, 22 last of ‘gillfishe’ (a type of stockfish) valued at £5 per last and 4 C of ‘gillfishe’ valued at 10s. per C were imported from Iceland.³⁶ This valuation suggests 10 C = 1 last, as was common with other dry white fish. The valuation of 10s. per C was the same as for hake. The 1507 Book of Rates values ‘Stocke fiche called gyllfyshe’ at £10 per last.³⁷

Unit: 1 last = 2 freight tons, 1 C = 0.2 freight tons

Fish, Hake (*hake*) – C / M / quarter / piece

A very common Irish import, it is valued at 10s. per C, which is the same valuation as for Dogfish and Gillfish. In 1503/4, it is sometimes listed by the piece (i.e. an individual fish) at 1d. per piece or the quarter at 2s. 6d. per quarter. This confirms that hake was normally traded whole in a salted/dried form, with 120 fish to the C. Assumed, as with stockfish / gillfish, that 10 C = 1 last, suggesting 1 C = 0.2 freight tons.

Unit: 1 C = 0.2 freight tons, 1 M = 2 freight tons, 1 quarter = 0.05 freight tons, 1 piece = 0.00167 tons.

Fish, herring / white herring (*alb’ alec’*) – last / barrel

The chief import from Ireland, in the Bristol customs accounts white (pickled) herring are normally listed by the barrel or the last, with 12 barrels to the last. This corresponds to a note in a fifteenth-century ‘Common Place Book’ that ‘Barrell fish hath 12 Ale barrels to a last’.

³⁴ Gras, *Early English Customs System*, p. 703.

³⁵ Willan, *Tudor Book of Rates*, p 58.

³⁶ The same valuations were applied in the import of gillfish from Iceland in 1476., along with other types of fish, from Iceland in 1476: Carus-Wilson, *Overseas Trade of Bristol in the Later Middle Ages*, p. 208.

³⁷ Gras, *Early English Customs System*, p. 702.

The same account states that the ale barrel contained no more than 32 gallons (256 pints), which was about the same as the wine barrel (252 pints).³⁸ The use of barrels of this size for packing white herring is confirmed by a 1571 statute, which records that English ‘Subjectes using the Trade of fyshing for Herring have of many yeres, and tyme out of mynde used to packe theyr Herring in Caske [of] Barrels conteyning aboute thyrtey two Gallons of usuall Wyne Measure.’ The Act then goes on to note that, in practice, each barrel would only contain 28 gallons of fish, well packed, with at least a thousand herrings to the barrel.³⁹ The continued use of herring barrels containing 28 gallons in England, is confirmed into the eighteenth century.⁴⁰ The reason there were 12 herring barrels to the last (normally 2 tons), rather than 16 barrels (as would be the case with wine), is that a barrel of herring, with salt and pickle, weighed significantly more than a barrel of wine. Indeed, a mid-nineteenth century shipping manual noted that 144 barrels of white herring weighed 21.5 tons – implying 6.7 barrels per ton.⁴¹ Since the barrels used at that time seem to have been slightly smaller (26.67 imperial gallons) than those used in England during the later Middle Ages, it has been assumed here that the last of barrelled herring weighed 2 tons, with each barrel being the equivalent to 0.167 freight tons.
Unit: 1 barrel = 0.167 freight tons, 1 last = 2 freight tons

Fish, herring red (*rub’ alec’*) – last / pipe / meise / barrel / C

While not as common as white herring, smoked ‘red’ herrings (kippers) were also a major Irish import. Commonly recorded by the ‘mease’ (5 long hundred: i.e. 600 fish), valued at 5s. per meise in the Bristol customs accounts. The size of the meise is confirmed by the 1503/4 account, which sometimes records red herring by the C, valued at 1s. per C. The 1485/6 customs account also records red herring by the meise valued at 5s., but more often by the barrel, valued at 6s. 8d., the ‘pipe’ valued at 20s. or the ‘last’ valued at 100s. This implies that there were 1.33 meise (800 fish) to the barrel, 3 barrels to the pipe, and 15 barrels to the last – rather than the 12 barrels to the last for white herring. It seems likely that this difference is because a barrel of smoked red herring weighed much less than pickled white herring. Freight dues on red herring would therefore logically relate to volume, rather than weight. The marked difference between the weight to volume ratio of red and white herring is noted in a nineteenth century shipping manual, which states that 180 barrels of red herring weighed just 11 tons – implying 16 barrels to the ton weight.⁴² The high freight volume of red herring is confirmed by a UK government report of the 1960s, which noted that 1 ton weight of boxed kippers occupied 72 cubic foot of space (1.8 freight tons).⁴³ Given that freight charges on red herring would presumably have been applied to the volume transported, rather than the weight, it was assumed that a barrel of red herring took up 0.125 freight tons (the same as for wine), that 1 last equalled 2 tons, and 1 meise was 0.167 tons.

Unit: 1 last = 2 freight tons, 1 pipe = 0.375 freight tons, 1 meise = 0.167 freight tons, 1 barrel = 0.125 freight tons, 1 C = 0.033 freight tons

Fish, Pollock (*pullok*) – C

³⁸ Hall and Nicholas, ‘Select tracts and table books’ pp. 29-30.

³⁹ *Statutes of the Realm*, Vol. IV, p.t 1. p. 546.

⁴⁰ *The statutes at large from Magna charta to the forty-first year of George III: Volume 5*, p. 140.

⁴¹ R. White Stevens, *On the stowage of ships and their cargoes with information regarding freights, charter-parties, &c., &c* (1867), p. 315.

⁴² R. White Stevens, *On the stowage of ships and their cargoes with information regarding freights, charter-parties, &c., &c* (1867), p. 315.

⁴³ J. J. Waterman, *Measures, Stowage Rates and Yields of Fishery Products* (Department of Scientific and Industrial Research, Torry advisory note, no. 17, 1964).

Valued in 1485/6 at 5s. per C, which is half the value of hake. Pollock is a white fish that can grow to a considerable size. As with hake and cod, it seems likely that the C refers to a number rather than a weight. Assumed that a hundred (120) took up roughly the same tonnage as hake.
Unit: 1 C = 0.2 freight tons

Fish, Salmon (*salmon*) – pipe / virken (firkin)

A very common import from Ireland. In 1503/4 it is valued at 30s. per pipe or 7s. 6d. per ‘virken’, implying 1 pipe = 4 firkins. The same valuation for a pipe of salmon was used in 1465/6 and 1485/6. A pipe of salmon was said to be 84 gallons (one third of a ton), with 6 pipes making a last, which would normally be 2 tons.⁴⁴

Unit: 1 pipe = 0.333 freight tons, firkin = 0.0833 freight tons

Fish, Salted (*pisc’ sals*) – C / burden / quarter / piece

A common Irish import, this was dry-salted white fish, valued by the long-hundred of 120 fish. The species of fish was presumably not specified either because the consignment involved a mix of fish, or because it was unknown. In the 1465/6, 1485/6 and 1503/4 accounts, ‘salt fish’ is valued at 3s. 4d. per ‘burden’ or 20s per C, implying 6 burden = 1 C. In one instance (3 Feb 1466) 16 salt fish are valued at 2s. 1d, which fits reasonably well with the notion that 1 burden = c.20 fish. In a few places salt fish is recorded by the ‘quarter’, with the customs valuations (10d. per quarter) indicating that this was a quarter ‘burden’ (i.e. 5 fish). On 15 September 1493, the Bristol customs accounts recorded the unusual import of 5 last of salted fish from Zeeland, valued at £10 per last.⁴⁵ The valuation fits with the common contemporary calculation that 10 C salted fish = 1 last.

Unit: 1 C = 0.2 freight tons, 1 burden = 0.033 freight tons, 1 quarter ‘burden’ = 0.00825, 1 piece = freight tons 0.0017

Fish, Scalpin (*scalpion*) – C

One entry in 1485/6 refers to three quarters of ‘scalpion’ valued at 20d. Scalpin are a name for ‘Whiting’ which are small white fish, similar to cod. The small size would explain why it was valued at just 2s. 3d. per C, which is less than a quarter that of hake (10s. per C). On that basis, it has been assumed that 1 C took up 0.05 tons of freight space. This is a quarter of the space for a C of hake.

Unit = 0.05 freight tons

Fish, stockfish, titling (*tytelling*) – last

Imported from Iceland on 18 September 1486, valued at 50s per last. Assumed a last was 2 tons. The 1558 Book of Rates notes that the C of ‘stockfish called Titlings’ contained 120 fish and that there were 10 C to the last.⁴⁶

Unit: 1 last = 2 freight tons

Fish, sturgeon (*sturgion*) – barrel

In 1503/4 one barrel is imported from Bordeaux, valued at 6s. 8d. Assumed it came in a standard wine barrel. The 1507 Book of Rates values ‘Sturgen the barrelle’ at 20s.⁴⁷

Unit: 1 barrel = 0.125 freight tons

Fish, white herring (see **Fish, herring**)

⁴⁴ Ronald Edward Zupko, *A Dictionary of Weights and Measures for the British Isles: The Middle Ages to the Twentieth Century* (Philadelphia, 1985) p. 303.

⁴⁵ TNA E122/20/9, fo. 57r.

⁴⁶ Willan, *Tudor Book of Rates*, p. 58.

⁴⁷ Gras, *Early English Customs System*, p. 702.

Flour (*farrine*) – last

A single export to Iceland in 1465/6, valued at 30s. the last. Assumed 1 last = 2 tons.

Unit: 1 last = 2 freight tons

Fruit (*fructe*) – ton / hogshead / C / piece

In 1503/4 valued at £2 per ton, 20s. per pipe, 10s. per hogshead and 2s. per C. Also by the ‘piece’ of 1s 4d., implying 30 pieces = 1 ton.

Unit: 1 ton = 1 freight ton, 1 hogshead = 0.25 freight tons, 1 C = 0.05 freight tons, 1 piece = 0.0333 freight tons

Ginger (*gynger*) – quarter / lb.

In 1503/4, one-and-a-half ‘quarters’ ginger (i.e. 45 lb.) was imported from Lisbon valued at 10d. per lb. There are also a few references to single lbs. of ginger being exported from Bristol to Ireland at 12d. per lb.

Unit: quarter ‘C’ = 0.0125 freight tons, lb. = 0.0004 freight tons

Girdles (*zonaris*) – dozen

There is a single reference to 4 dozen girdles exported to Ireland on 28 March 1504. These become a more common export later in the sixteenth century, with variant entries for ‘girdles’ in the 1558 Book of Rates subdivided according to material.⁴⁸ It is assumed these would be light-weight and not particularly bulky, perhaps taking up about one cubic foot per dozen.

Unit: 1 dozen = 0.025 freight tons

Goshawks – piece

There are three entries to imports of ‘goshawks’ from Ireland in 1503/4, valued at £1 per bird. Assumed each bird had a cage and took up, in total, 4 cubic foot.

Unit: 1 bird = 0.1 freight tons

Grain (*frumente*) – wey

In July 1504, there are four entries to the import of unspecified grain (*frumente*) from Zeeland, Antwerp and Guernsey in significant quantities, along with a smaller consignment from Ireland. The grain was all valued at 30s per wey. The total amount was 157.5 wey. Assumed the same freight weight for wheat.

1 wey = 1.2 freight tons

Hawk – piece

One reference to the import of a hawk from Ireland, valued at £1. Given that a hawk would need a reasonable amount of space, assume 0.1 tons of cargo space (4 cubic foot), as with ‘goshawks’.

Unit: 1 bird = 0.1 freight tons

Hemp – stone

One reference to 1 stone ‘hempe’ exported to Ireland in 1504. This would be hard to pack tightly, so assumed that 1 stone (14 lbs.) occupied 1 cubic foot.

Unit: 1 stone = 0.025 freight tons

Hides, Salted (*corrior’ sals’*) – dicker / piece

⁴⁸ Willan, *Tudor Book of Rates*, p. 28.

These are a common import from Ireland, valued at 13s. 4d. per dicker (10 hides) or 16d. per hide. Assumed the same weight as for tanned hides (below).

Unit: 1 dicker = 0.167 freight tons, 1 piece = 0.0167 freight tons

Hides, Tanned (*corrior' tannat'*) – dicker (1 dicker = 10 hides)

Modern cow / steer hides weigh about 55-65 lbs.⁴⁹ However, while the average whither height of Tudor cows was only 1.22 metres, most modern breeds are considerably larger than this.⁵⁰ For instance, Britain's most common dairy cow, the Friesian, averages 1.33 metres / 600 kg when fully mature, while the most common beef cow, the Hereford, averages 1.30 m / 540 kg.⁵¹ Among modern breeds from the British Isles, the closest in height to late medieval cows is the Irish Kerry, average 1.22 m / 375 kg.⁵² Since this is only about two-thirds the size of the most common breeds, it was assumed that cow or steer hides in the fifteenth century would have weighed about 40 lbs. This would make a dicker 400 lbs., or 0.167 tons.

Unit: 1 dicker = 0.167 freight tons

Honey (*mellis*) – tun / barrel

In 1465/6 valued at 50s. per ton for imports from Portugal and 14s. per barrel for exports to Ireland. In 1485/6 valued at 50s. per tun for imports from France and 11s. 8d per barrel for exports to Ireland. In 1503/4 valued at 50s. per ton for imports and 11s. 8d per barrel for exports. This suggests that different duties were applied on imports and exports, possibly because English honey was considered superior. Contemporary descriptions of the measures used for honey imply that the same measures were used as for wine and oil barrels / tons.⁵³

Unit: 1 ton = 1 freight ton, 1 barrel = 0.125 freight tons

Hops (*hoppes*) – C / sack

In January 1504, the Bristol merchant and explorer, Robert Thorne, imported 8 C 'hoppes' from Andalusia, valued at 10s. per C. In August that year 5 sacks 'hoppes' were imported, along with oranges and madder, valued at £2 per sack. That might imply 4 C = 1 sack, but the 1507 Book of Rates suggests that 'Hoppys the sack containing viiC' was valued at £2, the same rate applied in January 1504.⁵⁴ The 1558 Book of Rates states that 'Hopes' 'the sack containing vi c.' was valued at £3.⁵⁵ Modern dried hops weighs 35 lb. per cubic foot. On that basis 120 lbs. would occupy 3.4 cubic foot and a sack of 6 C would be 20.6 cubic foot.

Unit: 1 C = 0.085 freight tons, Sack = 0.52 freight tons

Horse – piece

In July 1504, three horses are imported from Ireland, valued at £1 per horse. Even if kept tightly confined in a stall, it is assumed a horse would take up around 200 cubic foot of stowage space.

Unit: 1 horse = 5 freight tons

Incense (*thures*) – C

On 30 May 1504, 3 C 'Thures' valued at 3s. 4d. per C was imported from Bayonne, along with some other unusual commodities: 'ores' (oars) and 'fethers' (feathers). While 'thures' was

⁴⁹ 'Prices', *Leather*, March 1996, p. 64.

⁵⁰ S. J. M. Davis, *The Archaeology of Animals* (London, 1987), p. 178.

⁵¹ M. H. French, *European Breeds of Cattle*, Vol. I (Rome, 1966), pp. 120-25, 137-43.

⁵² French, *European Breeds of Cattle*, pp. 151-55.

⁵³ Hall and Nicholls, 'Select tracts', p. 29.

⁵⁴ Gras, *Early English Customs System*, p. 699.

⁵⁵ Willan, *Tudor Book of Rates*, p. 33.

translated as ‘incense’ in the published account, this seems uncertain given the low price.⁵⁶ It has been assumed here that the C is a measure of weight.

Unit: 1 C = 0.05 freight tons

Irish linen Cloth (See Cloth, Irish linen)

Iron (*ferri*) – ton / pipe / hogshead / C

A very common import from ‘Hispania’ (northern Spain) and southwest France by the end of the fifteenth century, valued 50s. per ton.

Unit: 1 ton = 1 freight ton, 1 pipe = 0.5 freight tons, 1 hogshead = 0.25 freight tons, 1 C = 0.05 freight tons

Kermes (*grayne*) – ton / pipe / hogshead / C / quarter / lb.

Kermes, commonly referred to as ‘grayne / grain’ in this period, was a red dyestuff consisting of the dried bodies of the pregnant female insect *Coccus ilicis*, which were typically gathered from a species of evergreen oak in southern Europe and north Africa. It was used for dyeing cloth crimson and scarlet. In 1465/6 ‘grayne’ is valued at £20 per ton, £10 per pipe and £5 per hogshead. In 1485/6, 2.5 ‘C lbs.’ coming from Pisa, was valued at £13 6s. 8d. (£5 6s. 8d. per C lb.), while 5 lb. on the same ship is valued at 8s. 4d. (20 d. per lb.). The lack of obvious correspondence between the valuations may imply the customs officers were relying on declarations of value by the merchants, rather than a Book of Rates. Prices in 1503/4 are similarly inconsistent.

Unit: 1 ton = 1 freight ton, 1 pipe = 0.5 freight tons, 1 hogshead = 0.25 freight tons, C = 0.05 tons, quarter = 0.0125 freight tons, lb. = 0.0004 freight tons

Knives (*cultell*) – gross / dozen

A common export to Ireland by 1503/4. They were valued at 6s. 8d per gross or 6d. per dozen. Since this is just a halfpenny per knife, these were presumably very small items, such as pen knives, used for sharpening quills. If so, a gross probably weighed no more than 10 lbs.

Unit: 1 gross = 0.004 freight tons, dozen = 0.0004 freight tons

Lead (*plu’be*) – ton / C

Lead, or worked lead (*plumbe operat*) was fairly common export from Bristol by 1503/4, valued at £5 per ton, or 5s. per C.

Unit: 1 ton = 1 freight ton, 1 C = 0.05 freight tons

Liquorice (*licoric*) - bale / lb.

Valued in 1465/6 as 5s. per bale on an import from Guipúzcoa in Northern Spain. In 1503/4, the export of 26 lbs. to Ireland was valued at 5s. The 1558 Book of Rates states that a bale was ‘two c. at v.xx xii [112] pound the c.’⁵⁷ It is assumed liquorice paid freight by weight, albeit freighting by volume is possible if the liquorice was in stick form.

Unit: bale = 0.1 freight tons, lb. = 0.0004 freight tons

Mace (*mac*) – lb.

There are two references to the export of 1.25 lb. of mace to Ireland in 1503/4, valued at 2s. per lb.

Unit: 1 lb. = 0.0004 freight tons

⁵⁶ Susan Flavin and Evan T. Jones (eds.), *Bristol’s Trade with Ireland and the Continent, 1503-1601: the evidence of the exchequer customs accounts* (Four Courts Press, Dublin), p. 70.

⁵⁷ Willan, *Tudor Book of Rates*, p. 38.

Malt (*braci'*) – wey / quarter / bushel

A fairly common export to Ireland, presumably for making ale. Sometimes listed in combination with wheat or beans.

1 wey = 6 quarters = 48 bushels.

Unit: 1 wey = 1.2 freight tons, 1 quarter = 0.2 freight tons, 1 bushel = 0.025 freight tons

Madder (*madder*) – bale / C

A dyestuff: in 1503/4, valued at 40s. per bale and 6s. 8d. per C. Implies 1 bale = 6 C. The 1507 Book of Rates lists 'Mather' by the bale, as does the 1558 Book of Rates, which says 1 bale = 8 C.⁵⁸ It is assumed it was freighted by weight.

Unit: 1 bale = 0.3 freight tons, 1 C = 0.05 freight tons

Mantles (*Mant'*) - piece

These were bulky woollen cloaks, imported from Ireland, valued at 3s. 4d. per piece. They were a very common import, with 206 entries recorded in the 1503/4 customs account. It was assumed a piece occupied one cubic foot of freight space.

Unit: 1 piece = 0.025 freight tons

Mantles, Fox (*mantell vulpin*) – piece

The 1503/4 account records the import of two fox mantles from Lisbon. Assumed each took up 2 cubic foot of space.

Unit: 1 piece = 0.05 freight tons

Marmalade (*marmylad*) – C/ quarter / rove

The 1503/4 account contains six references to the import of marmalade from Lisbon, valued at 10s. per C, 2s. 3d. per quarter (30 lbs) and 2s. 6d. per rove. This suggests a 'rove' was about 30 lbs. The 1507 Book of Rates values 'Marmelado the lb.' at £4. This must be an error – possibly 4d. is intended. The 1558 book of rates values 'Marmelade the pound' at 8d.⁵⁹

Unit: 1 C = 0.05 freight tons, 1 quarter / rove = 0.0125 freight tons.

Mead (*methe*) – ton

Valued in 1465/6 at 20s. per tun for a voyage to Iceland.

Unit: 1 tun = 1 freight ton

Mercury (*mercurie*) – C

In 1486, 1.5 C 'mercurie' was imported from the Levant, valued at 100s.

Unit: 1 C = 0.05 freight tons

Mutton fat (*cepi' mult'*) – C

The 1503/4 account contains a reference to an uncertain item imported from Ireland that may be mutton fat / tallow. It is valued at 6s. 8d. per C. Assumed this relates to weight.

Unit: 1 C = 0.05 freight tons

Nails (*clavos*) – M

In March 1466, a single consignment of 20 M 'clavos' was imported from Guipúzcoa in Northern Spain valued at 30s. – i.e. 1s. 6d. per M. The 1507 Book of Rates contains various entries for 'naylles' according to size and type, such as 'Naylles called small nayles the

⁵⁸ Gras, *Early English Customs System*, p. 700; Willan, *Tudor Book of Rates*, p. 40.

⁵⁹ Gras, *Early English Customs System*, p. 700;

b[arrelle]’ valued at £3.⁶⁰ The 1558 Book of Rates lists small nails by the barrel at £8 but also ‘patten nailes the sum containing x thousand’ valued 4s.⁶¹ The fifteenth-century *Noumber of Weyghtes* notes that ‘Nayls’ were commonly reckoned by the ‘summe and hyt conteynythe 10,000.’⁶² That 20 thousand nails were valued at just 30s. in 1466, while a ton of bar iron was valued 50s., suggests that the entire consignment would not have weighed that much. That is possible if very small nails, such as patten nails, were involved. It has thus been assumed that 1 M (1200 nails) weighed 12 lb., with the entire consignment weighing 240 lbs.

Unit: 1 M = 0.005 freight tons

Needles (*nydles*) – clout

In July 1504 there is a single reference to the export to Ireland of ‘1 clowte & di. Nydles’, valued 1s. This immediately follows on from an equally unusual entry for 6 doz. thimbles. A ‘clout’ is a piece of cloth containing a certain number of needles. For current purposes, it is assumed 1 clout took up 0.01 cubic foot (17 cubic inches).

Unit: 1 clout = 0.00025 freight tons

Nutmeg (*nutmygges*) – lb.

The 1503/4 account contains a couple of references to nutmeg, valued at 1s. per lb.

Unit: 1 lb. = 0.0004 freight tons

Oars (*owres, ores*) – piece / dozen

The 1503/4 account records the import of 23 dozen oars from Bayonne, valued at 4s. per dozen. This is the same valuation as the 1507 Book of Rates, which rates ‘Orrys for bottes the C’ at 40s.⁶³ Assumed a dozen oars would take up 20 cubic foot (half a freight ton).

Unit: 1 dozen = 0.5 freight tons

Oil, Olive (*olei*) – tun / pipe / hogshead / kanter

A major import from Portugal and Andalusia. Valued 80s. per ton, 40s. per pipe, 20s. per hogshead and 1s. 6d. per ‘kanter’. The valuation for a kanter suggests it was 1/50th ton, albeit a ‘kantar’ is normally said to be 100 lb.

Unit: 1 ton = 1 freight ton, 1 pipe = 0.5 freight ton, 1 hogshead = 0.25 freight ton, 1 ‘kanter’ = 0.02 freight ton

Oranges (*orynges, orenge*s) – thousand pieces

Four import consignments recorded in 1503/4, valued 10s. per thousand or £4 for 24 C (3s. 4d. per C). In the 1558 Book of Rates oranges are valued 6s. 8d. per thousand.⁶⁴ This seems to be a reference to the number rather than a weight. A thousand modern oranges weigh c. 400 lbs., so it has been assumed that 1 M = a sixth of a ton.⁶⁵

Unit: M = 0.167 freight ton

Orchil (*orchell*) – C

Orchil is a violet or red dye made from lichen. In the 1503/4 customs accounts, orchil appears as an import from Andalusia valued at 10s. per C. It is assumed it was transported by weight.

⁶⁰ Gras, *Early English Customs System*, p. 700.

⁶¹ Willan, *Tudor Book of Rates*, p. 41.

⁶² Jenks, ‘Werkzeug des spitmittelalterlichen Kaufmanns’, p. 305. Note that Jenks corrects an earlier transcription of this fifteenth-century document, which transcribes ‘10,000’ as 10,000 lbs.: Hall and Nicholas, ‘Select tracts’, p. 15.

⁶³ Gras, *Early English Customs System*, p. 701.

⁶⁴ Willan, *Tudor Book of Rates*, p. 43.

⁶⁵ F.A.O., *Production Yearbook*, Vol. 25 (1971), p. 725

In 1507 Book of Rates, 'ortshall the c wayte' is valued 13s. 4d.⁶⁶ In the 1558 Book of Rates, orchil is valued at 20s. per C.⁶⁷

Unit: C = 0.05 freight tons

Orchil, worked (*orchell operat'*) – Stone

In the 1503/4 customs accounts, worked orchil is a common export to Ireland valued at 1s. 8d. per stone. That it was described as 'worked' presumably implies it had been processed in some way. It is assumed 1 stone = 14 lbs.

Unit: 1 stone = 0.00583 freight tons

Osmond – barrel

In April 1466, seven barrels of Osmund valued at 8s. per barrel was exported to Iceland. Osmund is a high-quality iron, of a type common to Sweden. It is not generally thought that it was produced in England until the mid-sixteenth century, so may be a re-export sent to Iceland to satisfy the demand of that market. The 1507 Book of Rates, values 'Ossmoundes the last' at 40s.⁶⁸ The 1558 Book of Rates lists 'osumunds the last containing xii barrels', valued at £5' (8s. 4d. per barrel).⁶⁹ This would suggest that a barrel of Osmund iron weighed 0.167 tons.

Unit: 1 Barrel = 0.167 freight tons

Paper (*paper'*) – ream

In 1503/4 there are two entries for 'di Reme paper' to Ireland, valued 2s. per ream. A ream of paper typically contained 480 sheets. The 1507 Book of Rates has an entry for 'Paper called wyte [i.e white] the reme', for which no value is given, albeit a value for brown paper (valued by the bale) is given.⁷⁰ The 1558 Book of Rates records that 200 reams of paper imported from France made up a 'ton'.⁷¹ That implies 1 ream occupied 0.2 cubic foot.

Unit: 1 ream = 0.005 freight tons

Penner (*pennariores*) – piece

In August 1504, 11 penners (pen cases) were exported to Ireland, valued 1d. each. These became a much more common export later in the century. It is assumed each took up 0.005 cubic foot (9 cubic inches).

Unit: 1 piece = 0.0001 freight tons

Pepper (*piperis*) – C / quarter / lb.

In 1503/4, pepper was a frequently import item from Lisbon, valued at £5 per C. It also appears as an export item to Ireland, valued at 1s. per lb. The 1507 Book of Rates values 'Peper the c wayte' at £6.⁷² The 1558 Book of Rates indicates that the C of pepper was 100 lb. (rather than 120), which explains why the pepper in Bristol was valued at 1s. per lb. and 100s. per C. Today, shippers calculate that 33 lb. of peppercorns will take up 1 cubic foot.⁷³ On that basis, 1 C (100 lbs), would be 3 cubic foot (0.075 tons), making 1 lb. = 0.00075 tons.

Unit: 1 C = 0.075 freight tons, 1 quarter = 0.001875 freight tons, 1 lb. = 0.00075 freight tons

Pewter (*pewte'*) – lb.

⁶⁶ Gras, *Early English Customs System*, p. 701.

⁶⁷ Willan, *Tudor Book of Rates*, p. 43.

⁶⁸ Gras, *Early English Customs System*, p. 701.

⁶⁹ Willan, *Tudor Book of Rates*, p. 44.

⁷⁰ Gras, *Early English Customs System*, p. 701.

⁷¹ Willan, *Tudor Book of Rates*, p. 85.

⁷² Gras, *Early English Customs System*, p. 701.

⁷³

In December 1465, a consignment of 33 lbs. of pewter was shipped to Lisbon, valued at 8s. 3d. (3d. per lb.). Given that Bristol produced pewterware, this was presumably finished goods, rather than the raw metal. Calculating the freight space that 1 lb. of pewterware would take up is difficult. The metal itself weighs about 455 lb. per cubic foot, making it seven times denser than wine (62 lb. per cubic foot). In certain forms, such as jugs or tankards, a ton weight of pewter can take up more than one freight ton (40 cubic foot). Yet in other forms, such as plates or nested bowls, a ton weight can take up much less than 40 cubic foot.⁷⁴ Given the absence of further information, it has been assumed that freight dues for pewter were determined by weight, rather than volume.

Unit: 1 lb. = 0.0004 freight tons

Perry (*perrey*) – tun

A single consignment of 9 tons of perry (pear cider) was sent to Iceland in 1466.

Unit: 1 ton = 1 freight ton

Pillus tinctus – C / lb.

A common export to Ireland by 1503/4, valued at 4d. per lb. or £2 per C. This implies 1 C = 120 lbs. It is uncertain what this commodity is. However, 'tinctus' suggests a dyed or coloured product, while 'pillus' might be 'hair' or 'wool'. Either would have been bulky products relative their weight, so it has been assumed that 1 C occupied 5 cubic foot (0.125 freight tons) and 1 lb. occupied 0.001 freight tons.

Unit: 1 C = 0.125 freight tons, 1 lb. = 0.001 freight tons.

Pitch (*piche*) – tun / pipe / hogshead / barrel / C

An occasional import item from western France. In 1503/4, 1 C is valued at 1s. 4d., 1 barrel at 3s. 4d., 1 hogshead at 6s. 8d. and 1 pipe at 13s. 4d. It thus appears that standard wine measures were employed.

Unit: 1 tun = 1 ton, 1 pipe = 0.5 freight tons, 1 hogshead = 0.25 freight tons, 1 barrel = 0.125 freight tons, 1 C = 0.05 freight tons

Rosin and Pitch (*rosyn & pich*) – ton

The customs account sometimes record entries for 'rosin and pitch', rosin being a resin residue produced when turpentine is distilled. On 17 February 1466 'rosin and pitch' is valued at 26s. 8d. per ton, which is the same valuation given for shipments of pure rosin on the same date.

Unit: 1 ton = 1 freight ton

Points (*ligulas*) – gross

A common export to Ireland by 1503/4, valued at 1s. per gross. 'Points' were small ties or laces for fastening clothes. As such, they would not have taken up much freight space. The 1507 Book of Rates values 'Poynts the small grosse' (144) at 5d.⁷⁵ Allowing 100 gross (14,400) of packed points per cubic foot would imply 1 gross = 0.00025 tons.

Unit: 1 Gross = 0.00025 freight tons

Porteos – piece

A single entry on a voyage to Ireland valued at 3s. 2d. for two 'porteos' in 1503/4. This may be a travelling case or chest. Assumed each occupied 2 cubic foot (0.05 tons) of shipping space.

⁷⁴ For their advice on Bristol's medieval / early modern pewterware, I would like to thank Alyson and Mike Marsden.

⁷⁵ Gras, *Early English Customs System*, p. 702.

Unit: 1 piece = 0.05 freight tons

Porpoise (*purpus*) – barrel

In 1503/4, there is a single entry for 2 barrels of ‘purpus’ from Ireland valued at 5s. per barrel. This is the same valuation applied to pickled herring. The freight tonnage estimate is the same as that used for white herring.

Unit: 1 barrel = 0.167 freight tons

Prunes (*prunes*) – C

A single import in 1486 from the Levant of 7 C, with a declared value of £3 6s. 8d. Assumed it paid freight dues by weight.

Unit: 1 C = 0.05 freight tons

Rares – piece

A single entry coming from Ireland in 1503/4 for 95 ‘rares’, valued at 2s. for the consignment. Given the origin of the goods, it might be some form of low value fish. If so, assumed each piece is 1 lb.

Unit: 1 piece = 0.0004 freight tons.

Red leather (*redlether*) – dozen

A single export entry of 5 dozen ‘redlether’ to Ireland in 1504 valued at 3s. the dozen. This is marginally higher than the valuation for a dozen calfskins. The 1507 Book of Rates lists ‘Rede lashe for cushhyns’ at 2s. per dozen., while the 1558 Book values ‘Red lash the dosen’ at 3s. 4d.⁷⁶ Red ‘lasch’ was a type of fine red leather, possibly of Moroccan origin. Assumed the same weight for a dozen ‘redlether’ as for a dozen calfskins (see ‘Skins, calf’, below).

Unit: 1 dozen = 0.02 freight tons

Remmletes – piece

Twelve ‘Remmletes’ (or possibly ?kemerletes) exported to Spain in 1503/4 along with a mixed cargo of cloth including kerseys and Welsh straits. The consignment is valued at 40s. The valuation suggests the customs officer assessed the 12 ‘remmletes’ as being the equivalent of two Welsh cloths paying poundage. On this basis, estimated each piece was a sixth of the weight of a Welsh cloth and took up the same freight space.

Unit: 1 piece = 0.0125 freight tons

Rosin (*rosen*) – ton / pipe / hogshead / C

Rosin is a resin residue produced when turpentine is distilled. It is found in all three customs accounts, typically as an import from Bordeaux, valued at 26s. 8d. per tun, 6s. 8d. per hogshead and 1s. 4d. per C.

Unit: 1 ton = 1 freight ton, 1 pipe = 0.5 freight tons, 1 hogshead = 0.25 freight tons, 1 C = 0.05 freight tons

Rowse – C

A single import of 2 C of ‘Rowse’ from Ireland in 1504 valued at 20s. This may be ‘rouze’ (rove) nails, but this is uncertain. Assume the C is a reference to weight.

Unit: 1 C = 0.05 freight tons.

Saffron (*croc*) – lb.

⁷⁶ Grass, *Early English Customs System*, p 702; Willan, *Tudor Book of Rates*, p. 49.

A common export to Ireland, where it was much used as a dyestuff. It was valued at 6s. 8d. per lb. There were 75 entries for saffron in the 1503/4 customs account, but the total quantity dispatched that year only amounted to 635 lbs. That was because this precious commodity was nearly always sent in small quantities. Since it is unclear what form the saffron took, it has been assumed it was shipped by weight.

Unit: 1 lb. = 0.0004 freight tons

Salt (*salis*) – ton / pipe / hogshead / wey

Salt normally appears by the ton, pipe or hogshead, valued 8s. 4d. per ton when imported and 16s. 8d. when exported. The difference in valuation may be because different types of salt were involved. While the imports were almost certainly sea salt, coming from the salt pans of Biscay and Portugal, it seems likely that the exported salt was Droitwich salt from up the River Severn. This was made from boiling down brine from natural springs. Droitwich salt was cleaner and purer than that obtained from salt pans, which was subject to contamination from bird droppings. It was thus favoured for some uses and commanded a high price.⁷⁷ On occasion, exported salt is listed by the wey, with 1 wey valued at 20s. This would imply that 1 wey = 1.2 tons, which indicates the same measure applied as for grain.

Unit: 1 ton = 1 freight ton, 1 pipe = 0.5 freight tons, 1 hogshead = 0.25 tons, 1 wey = 1.2 freight tons

Satin and Damask (see **Cloth, Satin and Damask**)

Scrofe – C / lb.

An occasional import from Ireland, valued 1d. per lb. or 10s. per C, suggesting the C was 120 lbs. It has not been possible to determine what this commodity was, so the tonnage estimates are based on its weight.

Unit: 1 C = 0.05 freight tons, 1 lb. = 0.0004 freight tons

Seal (*seele*) – piece

Two references in 1503/4 to the import of a 'seele' and a half a 'seele' from Ireland. This was presumably a seal carcass. They were valued at 6s. 8d. per piece – roughly equivalent to a barrel of white herring. The estimate of freight tonnage is thus based on the herring barrel.

Unit: 1 piece = 0.167 freight tons

Shipboards (*shipbordes*) – C / piece

There are three references to the import of shipboards from Ireland in 1485/6 and one in 1503/4. Valued at 20s. per C (120 boards), or 2d. per board. The *Noumbre of Weyghtes* notes that 240 boards of wainscot make a ship-last, so 120 boards would make a freight ton, with each board being 0.33 cubic foot.⁷⁸ This seems a reasonable estimate for a shipboard, which might be: 10 foot long x 5 inches wide x 1 inch thick.

Unit: 1 C = 1 freight ton, 1 piece = 0.0083 freight tons

Shoes? (*Calc*) – dozen

A single export to Bordeaux in 1466, valued at 5s. per dozen. On the assumption that these are shoes, which is uncertain, it has been estimated that a dozen took up 2 cubic foot (0.05 freight tons).

Unit: 1 dozen = 0.05 freight tons

⁷⁷ John Colins, *Salt and Fishery* (London, 1682); <https://hdl.handle.net/2027/aeu.ark:/13960/t0vq3p41g>

⁷⁸ p. 18.

Serches - doz

An unidentified product valued at 4s. 2d. per dozen. It always arrived with cargoes of Spanish iron, which suggests that it was a product of Guipuzcoa or its hinterland. It may be a 'searce' (sometimes written 'sarces' or 'serces') which was a Middle English word for a sieve / strainer.⁷⁹ In the absence of better information, it has been assumed, however, that the dozen relates to weight, so 1 dozen = 0.005 freight tons.

Unit: 1 dozen = 0.005 freight tons

Silk, worked (*cerec' operat'*) – lb.

While this was a common export to Ireland, it was very unusual for more than a few lbs. to be dispatched in any one consignment. Assumed 1 lb. worked silk would take up five times its weight in freight space. That would imply 1 lb. = 0.002 tons (1/12th cubic foot).

Unit: 1 lb. = 0.002 freight tons

Sine Vicur – last

A single export to Ireland in 1504 of one last valued at 30s. This is the same valuation as for 'beer', which is exported to Ireland on multiple occasions that year and is also recorded by the 'last'. It therefore seems likely that 'sine vicur' represents an unusual spelling of 'cervicia' (Latin for ale). As noted (see beer), the last of ale appears to have been 24 barrels. So, 1 last = 3 freight tons.

Unit: 1 last = 3 freight tons

Skins, Beaver (*bever*) – carg / load / roll

In 1503/4, 3 rolls imported from Bayonne valued at 10s. per roll. In 1485/6, 1 'carg.' (load) valued at 40s. Assumed a roll occupied 5 cubic foot and 1 carg. 20 cubic foot.

Unit: 1 roll = 0.125 tons, 1 carg = 0.5 tons

Skins, Calf (*pell' vitul'*) – doz

An occasional export item in this period, valued at 2s. 6d. per dozen in 1465/6 and 1503/4. When licenced for export in the later sixteenth century, 10 dozen calf skins were the equivalent of 1 dicker of hides.⁸⁰ It has thus been assumed that a dozen calf skins weighed one tenth of a dicker of tanned hides, with each calf skin weighing about 4 lbs. A dozen calf skins would thus be 48 lbs, or 0.02 tons.

Unit: 1 dozen = 0.02 freight tons

Skins, Calf tanned (*pell' vitul' tannat'*) - doz

Appears once in 1485/6 and much more often in 1503/4, this appears to have been simply a more complete way of writing 'pell' vitul' (calfskins), since the valuation at 2s. 6d. per dozen is the same.

Unit: 1 dozen = 0.02 freight tons

Skins, Deer (*pell' capr'*) – piece

In 1465/6, twenty-four 'pell damus' (buckdeer skins) valued at 5d. per piece were imported from Ireland. Elsewhere 3 pieces were valued at 4s. 2d. It has been assumed here that each skin was the same weight as a calf skin (4 lb.)

Unit: 1 piece = 0.0017 freight tons

Skins, Fawn (*pell' fawn*) – C / quarter / piece

⁷⁹ *Oxford English Dictionary*, 'Searce'.

⁸⁰ *Letters and Papers, Foreign and Domestic*, XVII, no. 443/7.

Two entries. Valued at 30d. per C (farthing per piece) in 1465/6. Valued at 15d. per quarter (30 skins) in 1503/4. This suggests the same valuation was applied by the customs officers as for lamb skins. Given that a lamb skin and a fawn skin would be roughly the same size, it has been assumed they were the same weight.

Unit: 1 C = 0.125 freight tons, 1 quarter = 0.03125 freight tons, 1 piece = 0.001 freight tons

Skins, Ferret (*ferares*) – dicker

There are two references in 1503/4 to ships arriving from Ireland carrying dickers of ‘ferares’ alongside various wild animal skins. That ‘ferares’ was measured by the ‘dicker’ implies that they were hides or skins of some type. They were valued at 2s. 6d per dicker (3d. per skin) – a quarter of the price per skin for martens (12d.) but twice the price of fox skins (1.5d.). This commodity was interpreted as ferret skins, although this is not certain. Assumed a dicker (10 skins) occupied 1 cubic foot.

Unit: 1 dicker = 0.025 freight tons

Skins, Fox (*pell' vulpin'*) – C / dozen / piece

A number of import entries from Ireland in 1503/4 valued at 1s. 6d. per dozen, or 1½ d. per piece. It was assumed that 1 piece occupied 0.1 cubic foot.

Unit: 1 C = 0.3 freight tons, 1 dozen = 0.03 freight tons, 1 piece = 0.0025 freight tons

Skins, Goat (*pell' capra'*) – C

Appears a couple of times, coming from Ireland with other skins. It is valued at c.15s. per C. Assumed same weight and freight allowance as for sheep, with 120 occupying 10 cubic foot.

Unit: 1 C = 0.25 freight tons

Skins, Kid (*pell' edores*) – C

Appears once in the 1485/6 account, coming from Ireland valued at 5s. per C. It was assumed a C (120) occupied five cubic foot, as with lamb.

Unit: 1 C = 0.125 freight tons

Skins, Lamb (*pell' Agnor'*) – M / C / quarter / dozen / piece

A common Irish import, valued at 5s. per C, which is half the price of sheep skins. Like sheep skins, they most likely had been shorn, making them suitable for parchment manufacture. It was assumed a C (120) occupied half the space of sheep skins – five cubic foot (0.125 freight tons).

Unit: M = 1.25 freight tons, C = 0.125 freight tons, quarter = 0.03125 freight tons, dozen = 0.0125 freight tons, 1 piece = 0.001 freight tons.

Skins, Marten (*pell' marteron'*) – piece

Nine entries in 1503/4 coming from Ireland, amounting in total to 24 skins, valued at 1s. per skin. Assumed that each occupied 0.1 cubic foot.

Unit: 1 piece = 0.0025 freight tons

Skins, Otter (*pell' oters*) – piece

Twelve entries in 1503/4 coming from Ireland, amounting to 68 skins, valued at 5d. per skin. Assumed that each occupied 0.1 cubic foot.

Unit: 1 piece = 0.0025 freight tons

Skins, Ox (*pell' bovin'*) – dicker

In 1465/6 there are two entries for ox hides coming from Ireland valued at 13s. 4d. per dicker and two entries for tanned ox hides exported to Spain and France, given the same valuation. The valuation is the same as that applied to ‘Hides, salted’ (see above), when imported from Ireland. So, it seems likely *pell’ bovin’* was just another way of recording salted hides. The same freight space calculation used for salted hides is applied.

Unit: 1 dicker = 0.167 freight tons

Skins, Rabbit (*pell’ cuniclores*) – C

A single entry to 1 C imported from Ireland in 1503/4 along with other wild animal skins, such as marten and fox. Assumed 120 skins occupied 2 cubic foot.

Unit: 1 C = 0.05 freight tons

Skins, Sheep no wool (*pell’ ovin’ no’ lan’*) – M / C / quarter / doz / piece

A very common Irish import in all three accounts, with 114 entries in 1503/4. Valued at 1s. per dozen or 10s. per C. The entries for sheep skins always specify that they were skins *without wool*. This would make them suitable for parchment manufacture. Assumed each weighed 2 lbs. and that a dozen occupied 1 cubic foot.

Unit: M = 2.5 freight tons, C = 0.25 freight tons, quarter [30 skins] = 0.0625 freight tons, dozen = 0.025 freight tons, 1 piece = 0.002 tons

Smigmates – C

Eighteen entries in 1503/4 coming from Spain, valued at 6s. 8d. per C. This is probably a type of soap, also known as ‘blacksoap’. Assume the C relates to its weight as with ‘soap’ (see below).

Unit: 1 C = 0.05 freight tons

Soap (*sope*) – C

One entry to 4 C ‘sop’ in 1466 coming from Lisbon, valued at 10s. per C. One entry to 2 C of ‘sope’ coming from Spain in 1485/6, valued at 5s. per C. The 1507 Book of Rates values ‘Sope called Castyll [Castile] sope or wyght [white] sope the c wyght [weight]’ at 10s.⁸¹

Unit: 1 C = 0.05 freight tons

Steel (*stele*) – C

One entry in 1466 to 4 C ‘stele’ coming with wine, iron and other Iberian goods, valued at 2s. per C. Assumed a C was a cwt.

Unit: 1 C = 0.05 freight tons

Stock-Cards (*stockardes*) – pair

Four entries in 1503/4 to total of 10 pairs of stock-cards, valued 1s. per pair, exported to Ireland. Stock-cards were a type of large wool-card, that were attached to a frame when used to card wool ready for spinning. The valuation was three times that of the regular wool ‘cards’ (see ‘Cards, unspecified’ above) in the 1503/4 ‘particular’ accounts. Assumed that each pair took up 1 cubic foot of shipping space.

Unit: 1 pair = 0.025 freight tons

Sugar (*sewger, sugar, sugor’*) – C / quarter

Two entries for ‘sewger’ coming from Portugal in 1466, valued at 56s. per C. Many more entries by 1485/6 to ‘sugar’ valued at 40s. per C coming from Spain, Portugal, Pisa, the Levant

⁸¹ Gras, *Early English Customs System*, p. 702.

and Madeira. In 1503/4 it was valued at 40s. per C and 10s. per quarter, arriving from Spain and Portugal.

Unit: 1 C = 0.05 freight tons, 1 quarter = 0.0125 freight tons

Sugar, Panele (*sugar panel*) - C

Four entries in 1485/6 to panele sugar (unrefined brown sugar) coming from Madeira, valued at 20s. per C.

Unit: 1 C = 0.05 freight tons

Sulphur (*brymston*) – pipe

One entry in 1485/6 to a pipe of brimstone coming from Iceland, valued 13s. 4d. per pipe. Assumed this is a standard pipe of half a ton.

Unit: 1 pipe = 0.5 freight tons

Tallow (*tallow*) – wey

Valued at 10s. per wey in 1465/6 and 1485/6. The 1507 Book of Rates values ‘Tallow in barrells’ at 10s. per barrel and ‘Tallow in cakes the c wayte’ at 6s. 8d’.⁸² The wey of tallow was typically 182 lbs.⁸³ The Bristol valuation roughly tallies with the 1507 valuation for cakes of tallow. So, it has been assumed that 1 wey tallow = 1.5 C (0.075 freight tons)

Unit: 1 wey = 0.075 freight tons

Taishail – piece

In 1503/4, three consignments of ‘Taishail’ arrived from Ireland, with five ‘pieces’ in total. It was valued at 10s. per piece, which is three times the price of an Irish mantle. It is unclear what this commodity was, but it seems likely to have been a manufactured product of some type. For current purposes, it has been assigned a volume of 2 cubic foot per piece.

Unit: 1 piece = 0.05 freight tons

Tar (*tarr, tarre*) – barrel

Only two entries listed in the three accounts. In 1485/6, five barrels ‘tarr’ coming from Ireland are valued at 3s. 4d. per barrel. In 1503/4, six imported barrels of ‘tarre’ are also valued 3s. 4d. per barrel. In the 1507 Book of Rates ‘Tarre the last’ is valued at 20s.’⁸⁴ A 1533 reference to tar bought by the navy notes that a barrel of tar was 16 gallons.⁸⁵ However, since tar is denser than water it has been assumed that 1 barrel would have been the equivalent, for freighting purposes, of a barrel of wine.

Unit: 1 barrel = 0.125 freight tons

Thimbles (*thymbles*) – dozen

One entry in 1503/4 to six dozen thimbles, valued 2d. per dozen. Assumed a dozen occupy 0.002 cubic foot (3.4 cubic inches).

Unit: 1 dozen = 0.00005 freight tons

Thread (*fili*) – lb.

Six entries in the 1503/4 customs account to a total of 9 lbs. thread valued at 5d. per lb. Assumed 1 lb. occupied 0.02 cubic foot (35 cubic inches – a ball c. 4 inches in diameter).

Unit: 1 lb. = 0.0005 freight tons

⁸² Gras, *Early English Customs System*, p. 704.

⁸³ Zupko, *Dictionary of Weights and Measures*, p. 435.

⁸⁴ Gras, *Early English Customs System*, p. 704.

⁸⁵ J. E. T. Rogers, *A History of Agriculture and Prices in England*, Vol. IV, (Oxford, 1882), pp. 394-95.

Tin, worked (*stagn' operat'*) – C

The 1503/4 customs accounts contain three entries for the export of *stagn' operat'* (worked tin or pewter) to Iberia, totalling 11 C. It was valued 30s. per C. This works out at 3 d. per lb., which is the same valuation applied to pewter. Following the same workings used for 'Pewter' (see above), it has been assumed that worked tin paid freight dues according to its weight.

Unit: 1 C = 0.05 freight tons, lb. = 0.0004 freight tons

Turpentine (*turpentin'*) - C

Two imports of turpentine listed in 1504 amounting to 5 C in total, valued at 13s. 4d. The 1507 Book of Rates values 'Tyrpytyn the c wayte' at 9s. 4d. per cwt.⁸⁶

Unit: 1 C = 0.05 freight tons

Verdigris (*verdegres*) – lb.

Four entries in 1503/4 to the export of a total of 11 lbs. of verdigris to Ireland, valued 6d. per lb. The 1507 Book of Rates values 'vergresse the c wayte' at 40s. That implies it was valued at 4d. per lb., which is close to the Bristol valuation.⁸⁷

Unit: 1 lb. = 0.0004 freight tons

Vinegar (*vini' egri', vini acri'*) – tun / pipe / hogshead

An occasional import from France and Portugal, arriving along with wine. It was thus almost certainly wine vinegar. Valued at 40s. per tun, it is recorded using the same measures as used for wine.

Unit: 1 tun = 1 freight ton, 1 pipe = 0.5 freight tons, 1 hogshead = 0.25 freight tons

Wax (*cere', wex,*) – C / quarter / lb.

Commonly imported in large quantities from Portugal and in much smaller quantities from Ireland. Valued 40s. per C and 4d. per lb., indicating 1 C = 120 lbs. The 1507 Book of Rates also values 'Wexe the c wayte' at 40s.⁸⁸

Unit: 1 C = 0.05 freight tons, quarter = 0.125 freight tons, lb. = 0.0004 freight tons

Whittles (*whitelles*) – piece

Three entries in 1503/4 amounting to a total of seven pieces. A type of cloak or mantle from Ireland, valued at 3s. 4d. This is the same valuation given for Irish mantles. As with mantles (see above), it was estimated that one piece occupied one cubic foot of freight space.

Unit: 1 piece = 0.025 freight tons

Wheat (*frumete, trituri'*) – wey / quarter

Two exports to Portugal listed in 1485/6, totalling 24 weys. Valued 20s. per wey. Contemporary estimates suggest that five quarters of wheat were equivalent to one tun of Bordeaux wine for shipping purposes.⁸⁹ There were six quarters to the wey, so 1 wey = 1.2 tons.

Unit: 1 wey = 1.2 freight tons, 1 quarter = 0.2 freight tons

Wine (*vini'*) – tun / pipe / hogshead / tierce / barrel

By far the most import from the France, Spain and Portugal, both by value and tonnage.

⁸⁶ Gras, *Early English Customs System*, p. 704.

⁸⁷ Gras, *Early English Customs System*, p. 705.

⁸⁸ Gras, *Early English Customs System*, p. 705.

⁸⁹ D. Burwash, *English Merchant Shipping 1460-1540*, p. 94.

Unit: 1 tun = 1 freight ton, 1 pipe = 0.5 freight tons, 1 hogshead = 0.25 freight tons, 1 tierce = 0.167 tons, 1 barrel = 0.125 freight tons

Wine, Corrupt (*vini corrupti*) – tun / pipe / hogshead

A common export item to Ireland, valued at 30s. per ton. The same measures were used as for wine.

Unit: 1 tun = 1 freight ton, 1 pipe = 0.5 freight tons, 1 hogshead = 0.25 freight tons, 1 barrel = 0.125 freight tons

Wood (*wode, gaid*) – pipe / measure

A common import from Bordeaux, this was an important dyestuff. Valued £5 per pipe or 6s. 3d. per ‘measure’, implying 1 pipe = 16 measures. Later in the sixteenth century it was commonly recorded by the ton, the bale or the C. The 1507 Book of Rates values ‘wood called Tholows [Toulouse] woode the bale’ 20s.⁹⁰

Unit: 1 pipe = 0.5 freight tons, 1 measure = 0.03125 freight tons

Wood ashes (*woodashes*) – seam

One entry to 0.5 seam ‘woodashes’ imported from Ireland in 1503/4 valued at 4s. per seam. A seam is typically a packhorse load, often figured as a ‘quarter’ (8 bushels or 384 pints) of grain.

Unit: 1 seam = 0.2 freight tons.

Wood, Brazil (*brasell*) – lb.

In 1503/4, 90 lb. of ‘brasel’ was exported to Ireland in 4 different consignments, valued 8d. per lb. Brazilwood was valuable dyestuff, used to produce a deep red. The ‘brazil’ mentioned here could be re-exported New World brazilwood (see below), since it was exported after some consignments of that product arrived in Bristol earlier that year. However, if it is assumed that 1 C = 120 lb., the Irish export was valued at 80s. per C. This is a much higher price. So, it seems possible that the brazil exported to Ireland was Asiatic brazilwood.

Unit: 1 lb. = 0.0004 freight tons

Wood, Brazil, New World (*brasell de terra nova*) – C

The 1503/4 account records the import of 54.5 C of New World brazilwood valued 33s. 4d. per C.⁹¹ This was all imported by alien merchants, most likely from Portugal, which had recently begun to import this valuable red dyewood from ‘the land of Brazil’ in South America.

Unit: 1 C = 0.05 freight tons.

Wool flocks (*flockes*) – stone

A common import from Ireland, these were tufts or locks of wool, valued 5d. per stone. A total of 179 stone was imported in 1503/4. Assumed the stone was the standard 14 lb. but that the wool occupied x 3 its weight (0.7 cubic foot) because it would be hard to pack tightly.

Unit: 1 stone = 0.0175 freight tons

⁹⁰ Gras, *Early English Customs System*, p. 705.

⁹¹ An error in the transcription of the published customs accounts means that one entry to 62 C of brasilwood was recorded as 32 C.

Table 1: Tons of merchandise exported, 1 October 1465 - 14 May 1466

Commodity	Tons exported
Battery	0.0690
Beer	6.0000
Bonnets	0.0825
Bows?	0.1400
Butter	0.2500
Cloth paying custom	210.3750
Cloth, other woollen	24.2058
Combs	0.0033
Flour	27.0000
Honey	5.8750
Malt	15.6000
Mead	2.0000
Osmond	1.1690
Perry	9.0000
Pewter	0.0132
Salt	92.4000
Shoes?	0.6000
Skins, Calf	0.0800
Skins, Ox, Tawed	1.3360
Vinegar	2.0000
Wine	10.2500
TOTAL	408.4488

Table 2: Tons of merchandise imported, 1 October 1465 - 14 May 1466

Commodity	Tons imported
Alum	0.5000
Cloth, Linen	3.6180
Cork	8.0000
Fish, Eels	2.3750
Fish, Hake	175.2000
Fish, Herring	439.3770
Fish, Herring, Red	70.4740
Fish, Pollock	0.2000
Fish, Salmon	10.4895
Fish, Salted	10.5957
Fruit	74.7640
Graynes	4.0000
Hides	0.1670
Honey	71.5000
Iron	124.5000
Liquorice	0.6000
Mantles	0.8500
Nails	0.1000
Oil, Olive	125.5000
Rosin	8.0000
Rosin and Pitch	4.0000
Saffron	0.0816
Salt	354.0000
Scrofe	0.0426
Skins, Beaver	1.0000
Skins, Deer	0.3784
Skins, Goat	0.9250
Skins, Lamb	2.4375
Skins, Ox	0.6680
Skins, Sheep, No Wool	33.2970
Soap	0.2000
Steel	0.2000
Sugar	0.1500
Tallow	0.7125
Vinegar	38.7500
Wax	10.2914
Wine	880.5000
Woad	6.5938
Wool, Flocks	0.0525
TOTAL	2465.0905

Table 3: Tons of merchandise exported, 29 September 1485 - 28 September 1486

Commodity	Tons exported
Alabaster, Tables of	0.1500
Alum	0.2250
Beans	128.4000
Cloth, paying custom	273.4750
Cloth, other woollen	54.6921
Fish, Herring, Red	1.6700
Hides, Tanned	1.1690
Honey	0.7500
Iron	1.5000
Lead, Worked	0.1500
Malt	7.2000
Perry	4.0000
Pilus Tinctus	0.7575
Saffron	0.0004
Salt	27.8000
Silk	0.0020
Skins, Calf, Tanned	0.2000
Stock-Cards	0.3000
Wheat	28.8000
Wine, Corrupt	64.7500
Wool Cards, Pairs	0.1000
TOTAL	596.0910

Table 4: Tons of merchandise imported, 29 September 1485 - 28 September 1486

Commodity	Tons imported
Alum	200.0000
Bowstaves	2.6622
Cinnamon	0.0240
Cloth, Camlet	0.6750
Cloth, Irish Linen	9.6390
Cloth, Wadmall	0.1026
Combs	0.4001
Compost	1.0000
Cork, Black	10.0000
Currants	1.3750
Dates	0.2667
Figs	1.0000
Fish, Cropling	29.0000
Fish, Dogfish	0.8000
Fish, Gillfish	44.8000
Fish, Hake	142.6500
Fish, Herring	212.5085
Fish, Pollock	1.7148
Fish, Salmon	141.6449
Fish, Salted	23.4345
Fish, Scalpin	0.0375
Fish, Stockfish, Titling	19.0000
Fruit	127.0000
Graynes	0.1270
Hawk	0.1000
Hides, Salted	30.4775
Honey	4.1700
Iron	282.5000
Mantles	10.1500
Mercury	0.0750
Nutmeg	0.0120
Oil, Olive	266.0800
Pepper	2.1863
Pitch	1.0000
Prunes	0.3500
Rosin	6.8500
Salt	430.0000
Satins & Damasks	0.0315
Scrofe	0.2680
Shipboards	6.5000
Silk, Worked	0.0230
Skins, Beaver	0.5000
Skins, Goat	0.5000
Skins, Kid	0.5000
Skins, Lamb	9.7188

Skins, Sheep, No Wool	32.0625
Soap	0.1000
Sugar	20.0605
Sulphur	0.5000
Tallow	0.0375
Tar	0.6250
Thread	0.0100
Vinegar	16.8750
Wax	3.1042
Wine	1217.5000
Woad	129.0050
Wool, Flocks	2.6163
TOTAL	3444.3497

Table 5: Tons of merchandise exported, 29 September 1503 - 28 September 1504

Commodity	Tons exported
Alum	0.3620
Aniseed	0.4424
Bacon	1.0175
Barley & Malt	2.4000
Battery	0.2870
Beans	132.9000
Beans & Barley	2.4000
Beans & Malt	90.3000
Beans and Peas	30.0000
Beans, Barley & Malt	14.4000
Beer	50.8750
Boras	0.0001
Breton Linen Cloth	0.4320
Calx	58.5000
Caps	0.1725
Cards, Unspecified	1.6000
Cinnamon	0.0020
Cloth, paying custom	248.2488
Coal	99.0000
Combs	0.0025
Cord	0.1000
Cork, Red	2.0000
Cushions	0.1500
Fish, Hake	2.2000
Fish, Herring White	5.6780
Fruit	0.1875
Fustian Cloth	0.0360
Ginger	0.0016
Girdles	0.1000
Grain	32.4000
Hemp	0.0250
Hides, Tanned	4.5090
Honey	1.5000
Hops	0.2550
Iron	3.6250
Kermes	0.0008
Knives	0.1036
Lead	25.1500
Liquorice	0.0104
Mace	0.0005
Madder	0.8000
Malt	18.9000
Mantles	0.5750
Mutton Fat	0.3000
Needles	0.0004

Orchil, Worked	2.2533
Paper	0.0005
Penners	0.0011
Pepper	0.0135
Pilus Tinctus	6.6722
Pitch	0.1250
Points	0.0666
Porteos	0.6000
Red Leather	0.1000
Remmletes Cloth	0.1500
Rosin	0.2000
Saffron	0.2539
Salt	31.7500
Silk, Worked	0.6210
Sine Vicur (probably beer)	3.0000
Skins, Calf Tanned	9.0900
Smigmatas	0.1375
Stock-Cards	0.2500
Thimbles	0.0003
Thread	0.0045
Tin, Worked	0.5500
Verdegris	0.0044
Welsh Cloth	48.0375
Wine	3.0000
Wine, Corrupt	63.5000
Wood, Brazil	0.0040
TOTAL	1002.3350

Table 6: Tons of merchandise imported, 29 September 1503 - 28 September 1504

Commodity	Tons imported
Almonds	1.8875
Alum	0.3000
Ashes, Lye	0.2500
Bise	0.0006
Boxstaves	4.7600
Breton Canvas Cloth	0.3000
Breton Linen Cloth	0.5558
Canvas Cloth	0.1000
Check Cloth	1.0057
Cinnamon	0.0196
Cloves	0.0432
Combs	0.2534
Comfits	0.1250
Cork	8.8000
Dates	0.1000
Fat, Mutton	0.0500
Feathers	0.6250
Fertes	4.0000
Fish, Eels	0.5625
Fish, Hake	187.4124
Fish, Herring Red	100.6815
Fish, Herring White	927.1885
Fish, Pollock	0.5000
Fish, Salmon	68.1826
Fish, Salted	25.2340
Fish, Sturgeon	0.1250
Fruit	183.0371
Ginger	0.0188
Goshawk	0.4000
Grain	189.0000
Hides, Salted	36.2390
Honey	1.6600
Hops	3.2800
Horses	15.0000
Illegible	0.1000
Incense (Thures)	0.1500
Irish Frieze Cloth	0.0660
Irish Linen Cloth	2.0588
Iron	268.0910
Kermes	0.2524
Madder	1.8000
Mantles	56.1250
Mantles, Fox	0.1000
Marmalade	0.3750
Nutmeg	0.0192

Oars	11.5000
Oil, Olive	116.4100
Oranges	1.2358
Orchill	3.6000
Pepper	3.3940
Pitch	1.8750
Purpes (porpoises)	0.3340
Rares/Raies?	0.0380
Rosin	23.1500
Rowse (Possibly Nails)	0.1000
Salt	458.2500
Scrofe	0.0488
Seal	0.2505
Shipboards	0.8300
Skins, Bever	0.3750
Skins, Calf	0.2000
Skins, Fawn	0.0313
Skins, Ferret	0.1250
Skins, Fox	1.0050
Skins, Lamb	37.2758
Skins, Marten	0.0600
Skins, Otter	0.1700
Skins, Rabbit	0.0500
Skins, Sheep (no wool)	105.8438
Smigmatas	10.7750
Sugar	0.6125
Taishaill	0.2500
Tar	0.7500
Turpentine	0.2500
Vinegar	3.1250
Wax	8.1400
Whitelles	0.4000
Wine	1875.5270
Woad	234.0313
Wood Ashes	0.1000
Wood, Brazil, New World	2.7570
Wool, Flocks	3.1325
TOTAL	4996.8366