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The lifecycle of casks: the production, use, and repurposing of casks in the Netherlands (1300-1800)

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5. Identifying content through casks



5. Identifying content through casks

This chapter discusses the use as transport container within the cask lifecycle (Figure 5.1) and is based on: Oosterbaan, J. (2023). Identifying Content through Casks. *Skyliss: Journal of Maritime and Limnetic Archaeology and Cultural History* (23), 103-116.

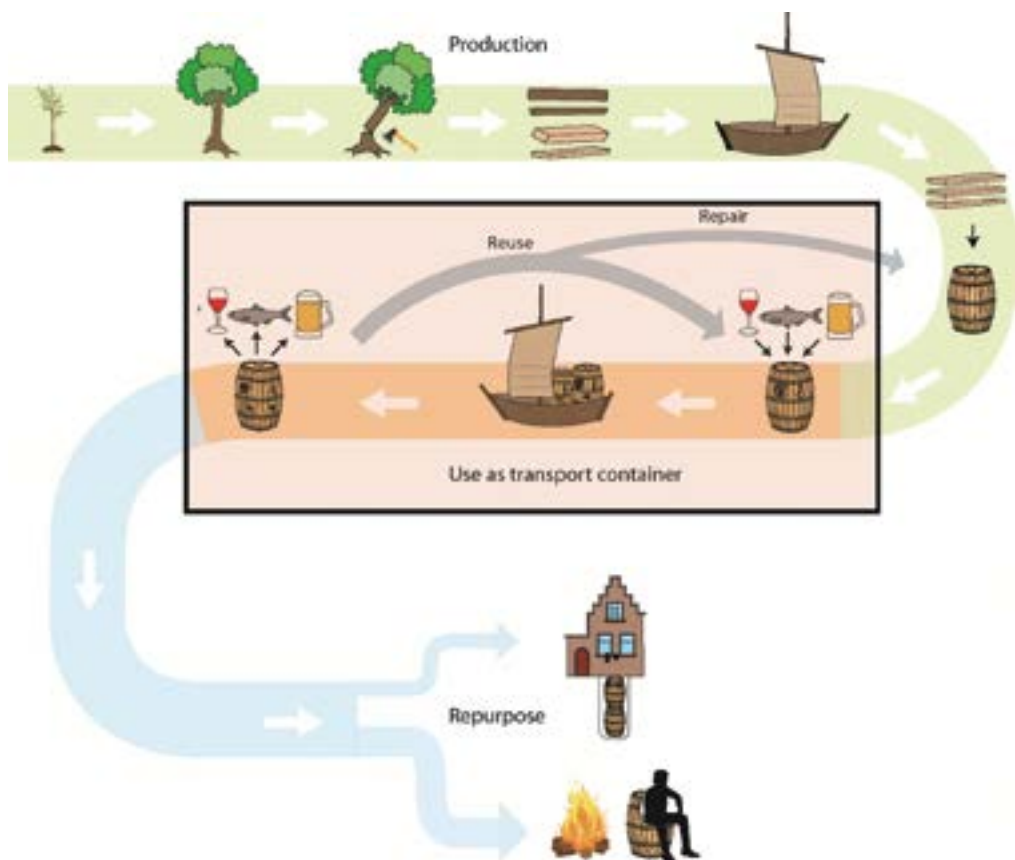


Figure 5.1: Schematic overview of the lifecycle of a cask. Production phase – green; its use as a transport container – orange; repurposing – blue. The frame highlights the part of the casks' lifecycle that is discussed in this chapter.

5.1 Introduction

Casks, the precursors of modern day shipping containers, played a vital role in the transportation of goods during the pre-industrial era. Regions specializing in trade, such as the coastal area of the Low Countries, witnessed an increasing demand for casks beginning in the Late Medieval period. Cooperies in the Low Countries catered to this demand by manufacturing a wide variety of casks, intended for storage and transportation of various products.

These products included:

- dry merchandise like grains, seeds, and spices,
- foodstuffs such as dairy products, meat, and fish, as well as water,
- alcoholic beverages like beer, wine, and spirits.

Given their ubiquity, casks are frequently discovered in urban archaeological sites throughout the Netherlands. However, despite their prevalence, determining the original contents of these casks remains a challenge, making it difficult to link the users of the casks to specific products and their trade networks. To address this issue, this sub-study examines the specifications of casks used for the two most important export products from the coastal regions of the Netherlands: beer and herring.

The brewing industry was primarily concentrated in the province of Holland and reached its peak during the period 1450–1650.¹⁸⁷ Archival sources show that during the mid-15th century, in various cities of Holland, including Amsterdam, Haarlem, and Leiden, the taxation on beer constituted as much as 50% of the cities' total revenue.¹⁸⁸ The number of beer casks that circulated can also be calculated based on archival sources. The archives of the states of Holland show that during the period 1543–1545, approximately 950,000 beer casks were used in the nine major beer-producing cities in Holland.¹⁸⁹

The second most significant export product of the coastal region of the Netherlands in the Late Medieval and Early Modern periods was herring. In the 1300s, most herring were caught in the narrow waterway between the Danish mainland and islands. By a twist of nature, herring shoals moved from this narrow waterway to the North Sea in the Late Middle Ages, creating favorable conditions for herring fisheries in the provinces of Flanders, Zeeland, and Holland.¹⁹⁰

However, even within these provinces, the center of the herring industry shifted. During the Late Middle Ages, the primary cities of importance were situated in Flanders, evidenced by the fact that it had a larger fleet of herring fishing vessels in operation than Zeeland and Holland.¹⁹¹

Beginning in the 16th century, cities in Zeeland and Holland progressively assumed a more significant role in the herring industry. Their combined herring fleets totaled approximately 1000 ships at the peak of the industry.¹⁹² Holland's

¹⁸⁷ Yntema, 1992, 25–28; Unger, 2001, 69.

¹⁸⁸ Yntema, 1992, 30–53; Unger, 2001, 70; Alberts, 2010, 120.

¹⁸⁹ Yntema, 1992, 61.

¹⁹⁰ Unger, 1978, 337; Poulsen, 2008, 40.

¹⁹¹ Van Vliet, 2005, 28.

¹⁹² Van Bochove, 2004, 4; Poulsen, 2008, 46.

cities, in particular, emerged as the dominant force in the herring fishery.¹⁹³ Rotterdam, Brielle, Delfshaven, and Maassluis, situated in the Meuse estuary, and Enkhuizen, in the northern regions of Holland, collectively brought in an annual catch averaging around 25,000 last at the peak of the herring industry, in the first half of the 17th century.¹⁹⁴

This information enables the quantification of the demand for herring casks by the Dutch herring fishery during the specified timeframe. According to historical sources, during the Late Medieval and Early Modern periods, one last of herring corresponded to 12–14 casks.¹⁹⁵ In this period, the standard equivalency is estimated to be 14 casks per last.¹⁹⁶ In other words, the annual demand for casks used by the Dutch herring fishery totaled approximately 350,000 casks.

In both the beer industry and the herring fishery, there was a significant demand for casks in coastal regions of the Netherlands in the Late Medieval and Early Modern periods. Local cooperies began to specialize in the production of casks specifically tailored for these products. To ensure consistency, various levels of authority (urban councils, provincial authorities, Habsburg rulers, etc.) issued legislation that mandated the specifications for beer and herring casks (e.g., height, number of staves, number of hoops). This legislation, preserved in archival sources, together with museum artefacts and casks from archaeological sites and depicted in paintings from the Low Countries shed light on the research question: how can Dutch herring and beer casks that were produced in the 15th till 18th centuries be identified?

5.2 Sources and methods

To help identify Dutch herring and beer casks built in the 15th to 18th centuries, various sources are used. These include legislation, its enforcement, and production and use of beer and herring casks.

Archival sources comprising legislation passed by various jurisdictions (urban, provincial and larger jurisdictions such as the Habsburg Empire) prescribe the specifications of beer and herring casks (size, capacity, number of staves, headboards, etc.) that were produced in the coastal regions of the Netherlands.

Monitoring the specifications of herring and beer casks, that is, ensuring compliance with legislation, was crucial for the industries, and was carried out by urban and guild councils. Amsterdam Museum contains gauge instruments that were used for this purpose, and they too are a data source for identifying casks.

¹⁹³ Van Vliet, 1994, 30.

¹⁹⁴ Van Bochove, 2004, 4.

¹⁹⁵ Harland, 2009, 2; Dijkman, 2011, 113.

¹⁹⁶ Unger, 1980, 260. Each of these herring casks contained approximately 500 herrings.

Paintings of the Low Countries from the 15th to 18th centuries depicting beer and herring casks are another source used in this sub-study. Only artwork produced by artists from the Low Countries within the designated research period were analyzed. The paintings were accessed through the online database of RKD.¹⁹⁷

Casks retrieved from maritime archaeology sites, that is, shipwrecks, proved most suitable for this sub-study because their original contents could have been preserved. Conversely, repurposed casks recovered in urban archaeology were not suitable because their original contents cannot be identified. Only casks found at shipwrecks in Dutch waters are included in this sub-study, as they can be directly linked to production activities in the Netherlands and consequently the corresponding legislation and enforcement in the region. The database of the Maritime Archaeological Depot of the Netherlands was consulted as a resource for this research.¹⁹⁸

5.3 Cask specifications

Cooperies in the Netherlands produced casks for a wide variety of products. As stated, beer and herring casks were in highest demand. The specifications of casks differed depending on their purpose, and they also changed over time and varied from city to city. But in what manner did the casks for specific products differ from one another?

The capacity, and therefore the dimensions of casks, varied according to the product they were made for. The dimensions also impacted the number of staves in a cask. Finally, the number of parts comprising the head of a cask also varied (Figure 5.2).

Achieving a watertight seal was critical in cask construction. However, this was more important when the contents exerted pressure on the casks. The thickness of the staves, the number of hoops used, and the quality of the timber used were all factors that contributed to a watertight fit. These specifications varied depending on the products for which the casks were intended.

Access to the contents of the casks was essential. Usually large bungholes were made in the bilge of the casks, facilitating filling and emptying, as well as cleaning of the interior. Typically, the cask heads were not removed for filling, as both heads were fitted into the crozes of the staves and could only be taken out by loosening the hoops, which caused the staves to separate and open up the cask.

In casks designed to contain liquid, taps were fitted in tapholes to facilitate the extraction of the liquid. In most casks with tap holes, a small additional hole was

¹⁹⁷ Database RKD Netherlands Institute of Art History, n.d.

¹⁹⁸ Database Maritieme Opgravingsdocumentatie n.d.

made to allow air to enter while the liquid was being drawn. Occasionally, smaller holes were made for the purpose of sampling the liquid.

In summary, the following specifications varied in casks depending on the product it was designed for:

- Capacity
- Dimensions
- Number of staves
- Number of headboards
- Thickness of staves
- Hoop sets
- Timber used
- Type of hole

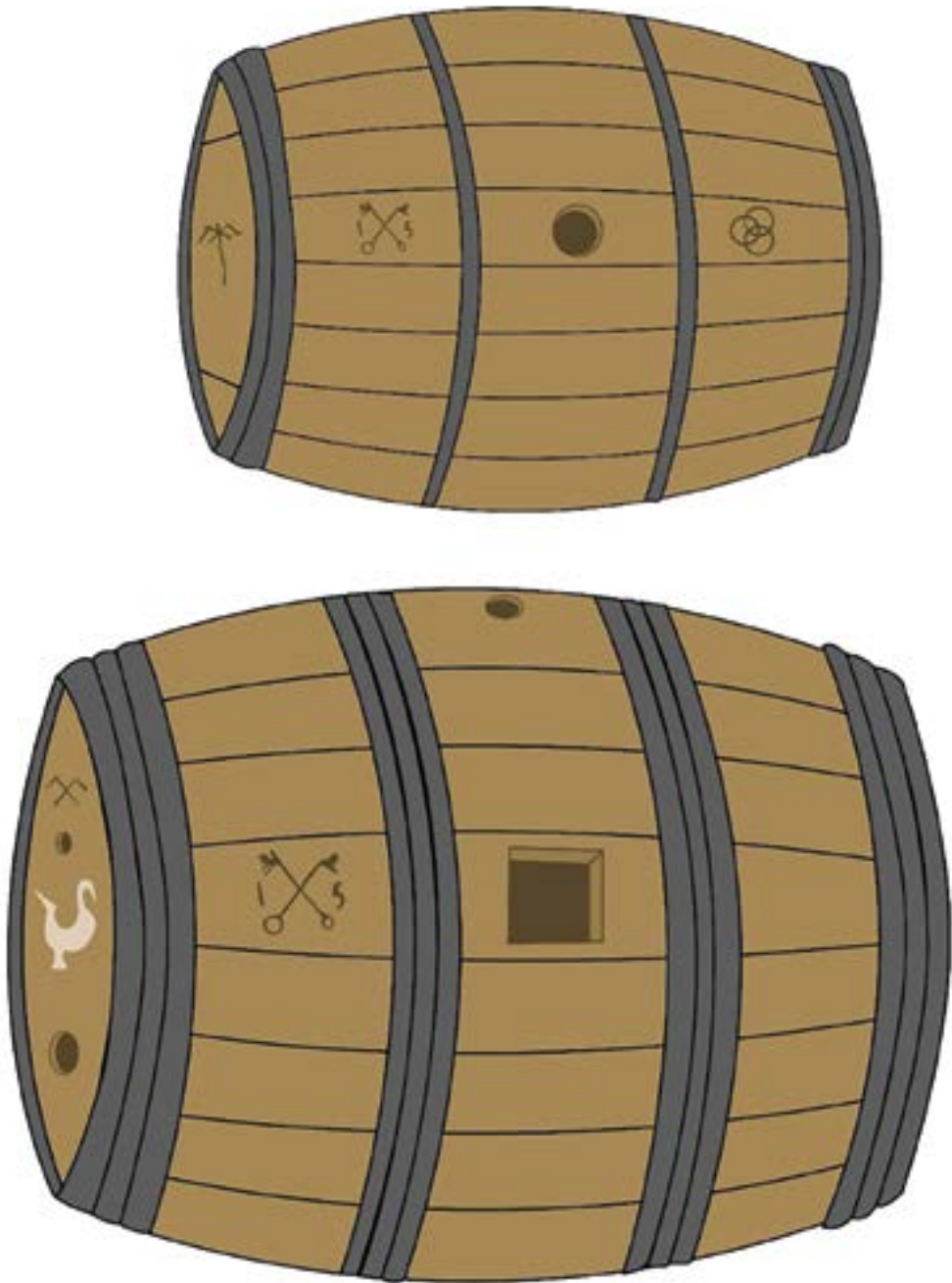


Figure 5.2: Artist impression of a herring cask (top) and a beer cask (bottom) in the Early Modern period.

5.4 Results

5.4.1 Legislated cask specifications

Legislation concerning beer and herring casks was enacted by various levels of authority. Each level of authority had its own legislative jurisdiction and formulated legislation accordingly. Urban authorities consisted of local government bodies and craft guild councils. They typically oversaw specific issues concerning cask construction, such as the thickness of the staves and the number of staves and headboards in a cask.

Provincial authorities also involved themselves in matters related to cask production. For example, Holland prescribed the capacity of casks in certain instances. Additionally, urban craft guilds that produced the same product sometimes joined forces to pursue common interests. The beer brewers of Holland formed the *Generale Brouwers van Holland* (General Brewers of Holland), while craft guilds in Zeeland and Holland specializing in the herring fishery established the *College van de Grote Visserij* (College of the Big Fishery).

Legislation of larger jurisdictions, such as the Habsburg Empire and the union of seven northern provinces following the Dutch revolt, dealt with matters affecting the entire region and was aimed at primary issues. In the case of beer and herring casks, these jurisdictions ruled on matters such as cask capacity and granted provinces and cities the right to collect taxes.

Beer casks

In the early 16th century, the beer industry in the coastal region of the Netherlands was regulated by both the Habsburg Empire and provincial authorities. According to a 1531 ordinance issued by the Habsburgs, new breweries were required to be located within city walls, transforming it into an urban industry from a rural one.¹⁹⁹

Beginning in 1580, the province of Holland sought to gain influence over this significant industry by issuing ordinances targeting the brewing sector. However, Holland's efforts were frustrated when the Habsburg Empire granted certain privileges to brewing cities. For instance, Charles V granted privileges to the cities of Gouda and Haarlem concerning excise and other tax collection related to beer production.²⁰⁰

These privileges provided both cities with a considerable degree of autonomy in regulating their brewing industries, and both the brewers and urban authorities defended these privileges vigorously because of the potential income the industry

¹⁹⁹ Yntema, 1992, 221.

²⁰⁰ Yntema, 1992, 221.

promised. However, urban brewers went beyond safeguarding their privileges and endeavored to influence decisions at the provincial level by establishing the Generale Brouwers van Holland in 1660, a lobbying group that remained active until 1811.²⁰¹

Due to the efforts of this group and other initiatives by beer-producing cities, regulating how beer casks were produced remained primarily an urban concern.²⁰² This led to significant regional differences in legislation on beer casks and hence differences in their specifications.

The variation in urban legislation that affected beer casks, usually in the form of ordinances issued by city councils, is most notable in regulations about the capacity of casks. This is illustrated in Figure 5.3, which depicts prescribed beer cask sizes and how this changed over the course of two centuries. As the figure shows, the prescribed capacity of beer casks differed significantly across cities. For instance, in 1550, the specified beer cask capacity in Amersfoort was 131 L, in Amsterdam it was 155 L, and in Breda, 148.2 L. Additionally, the figure shows a trend of increasing beer cask size across cities beginning in the 15th century. This trend likely reflects urban preferences for larger beer casks, as these allowed for more accurate measurement of their contents, reduced the number of casks that needed to be checked, and made fraudulent practices harder to carry out.

Other aspects of beer casks were mostly regulated by craft guilds (Table 5.1). This legislation guided coopers to ensure beer casks met regulations and also facilitated officials in verifying that casks had been constructed according to the required specifications. In most instances, beer casks were required to be constructed with 15 staves with a minimum thickness of 1.4 cm each. Additionally, the use of newly crafted hoops was required, which meant old hoops could not be reused.

²⁰¹ Timmer, 1918; Bakker et al., 1992, 178.

²⁰² Yntema, 1992, 219.

Table 5.1: Specifications of beer casks from guild archives of various cities in the Netherlands.

	Gouda (1490)	Haarlem (1567)	Dordrecht (1606)	Amsterdam (1609)	Leiden (1743)
Capacity	Same size as Hamburg's casks	Prescribed size in ordinance of Haarlem	Reference to the correct sizes as ordered by the city council	Same size as Dordrecht's beer casks: 76 <i>stopen</i> (2.4 L x 76=182.4 L); 1/2 cask: 40 <i>stopen</i> (2.4 x 40=96.l L)	Same size as Dordrecht's beer casks
Number of staves	Not mentioned	Minimum of 14 staves	Minimum of 15 staves; 1/2 cask: 13 staves	Minimum of 15 staves; 1/2 cask: 14 staves	Minimum of 15 staves; 1/2 cask: 13 staves
Width of staves	Not mentioned	Not mentioned	Staves of equal width	Not mentioned	Not wider than 5 <i>duymen</i> (12.9 cm)
Thickness of staves	Not mentioned	Not mentioned	2/3 <i>duym</i> (1.71 cm)	Not mentioned	Minimum of 1.4 cm
Number of headboards	Not mentioned	Not mentioned	Maximum of 3 headboards	Not mentioned	Maximum of 3 headboards
Thickness of head	So thick that it cannot be bent by hand	Not mentioned	1/2 <i>duym</i> (1.3 cm)	Not mentioned	Not mentioned
Timber used	Good Prussian timber	Eastern timber of good quality, without sapwood	Dry timber without sapwood, knots or wormholes	Dry timber without sapwood, knots or wormholes	Dried oak without wormholes, bad knots or sapwood
Hoops	Simultaneously made hoops	Not mentioned	Simultaneously made hoops	12 simultaneously made hoops	16 simultaneously made hoops
Holes	Not mentioned	Not mentioned	Not mentioned	Bunghole must be made	Taphole and bunghole must be made
Source	Ordinance of the Coopers, 1490 ²⁰³	Kuiperskeur, 25 October 1567 ²⁰⁴	RAD, GC, No. 563/6 Ordonnantie op het maken van biertonnen, 1606.	Willekeuren van de Kuypers en Wijn-verlaters No. 11, 22 July 1609. ²⁰⁵	Reglement Brander van de Biertonnen, 1743 ²⁰⁶

²⁰³Published in: Rollin Couquerque & Meerkamp van Embden, 1917, 105-106.

²⁰⁴Published in: Huizinga, 1911, 426-431.

²⁰⁵Published in: Smient & Smient, 1663, 497-498.

²⁰⁶Published in: Luchtmans, 1743, 1 - 20.

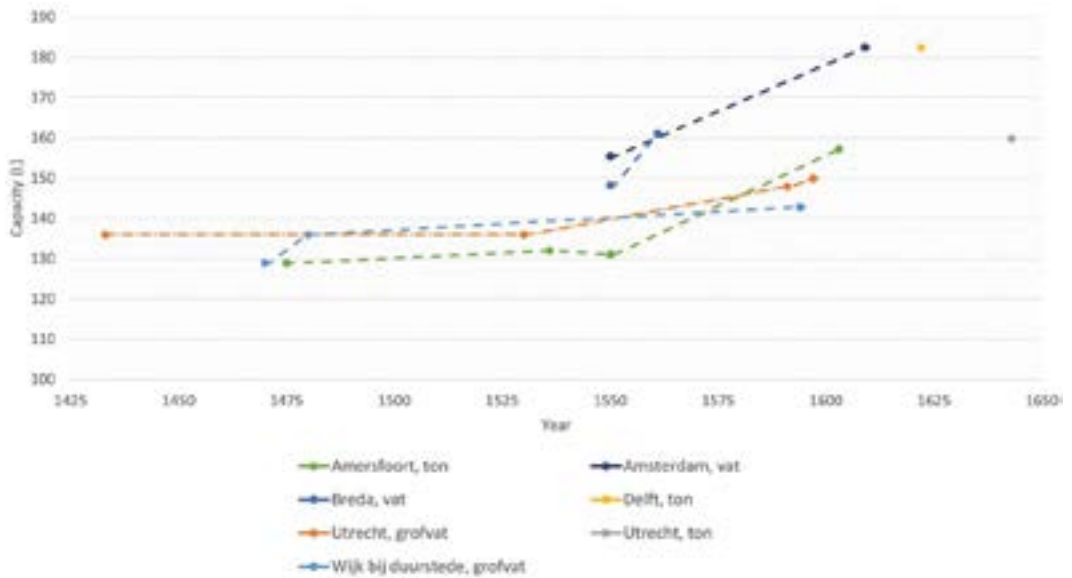


Figure 5.3: Diachronic change of beer cask capacity in cities in the Netherlands (sources: Alberts, 2010; Unger, 2001; Verhoeff, 1983).

Herring casks

During the Late Medieval period, rulers began standardizing herring casks in the provinces of Zeeland and Holland. For example, Duke Willem VI of Holland issued an ordinance in 1423 that mandated the size of casks in Brielle,²⁰⁷ although the exact dimensions of these casks are not known. Despite measures being taken to protect the quality of herring by Holland and Zeeland, complaints about herring persisted in various cities during the mid-15th century. To address these concerns, new ordinances were introduced in the late 15th century, establishing the Dordrecht cask with a capacity of 120 L as the standard herring cask.²⁰⁸

At the beginning of the 16th century, the competition between the herring industries of Flanders and Holland reached its peak. To level the playing field, the Habsburg ruler issued an ordinance standardizing the size of herring casks that applied to both counties.²⁰⁹

As the 16th century drew to a close, Holland dominated the herring industry. To safeguard this position, several cities with significant herring industries formed the College van de Grote Visserij in 1567.²¹⁰ This organization served as a lobbying group dedicated to protecting the interests of Holland's and Zeeland's collective herring fishery. Through its efforts, the capacity of herring casks remained at 120 L.

²⁰⁷ Beaujon, 1885, 7-8; Dijkman, 2011, 194.

²⁰⁸ Dijkman, 2011, 194.

²⁰⁹ Beaujon, 1885, 21.

²¹⁰ Unger, 1980, 261.

Table 5.2: Specifications of herring casks in the ordinances of Holland and West Friesland.

	Holland and West Friesland (1619)	Holland and West Friesland (1699)
Capacity	Not mentioned	Not mentioned
Number of staves	Minimum of 13 staves	Minimum of 12 staves
Width of staves	Staves of equal width, minimum of 2 <i>duym</i> (5.1 cm), maximum of 5 <i>duym</i> (12.8 cm)	Staves of equal width, minimum of 2 <i>duym</i> (5.1 cm), maximum of 5 <i>duym</i> (12.8 cm)
Thickness of staves	minimum of 1/2 <i>duym</i> (1.3 cm) at the ends; 1/3 <i>duym</i> (0.9 cm) at the bilge	minimum of 1/2 <i>duym</i> (1.3 cm) at the ends; 1/3 <i>duym</i> (0.9 cm) at the bilge
Number of headboards	Maximum of 3 headboards	Maximum of 3 headboards
Thickness of head	Not mentioned	Not mentioned
Timber used	Good timber	Good timber
Hoops	Simultaneously made hoops	Simultaneously made hoops
Holes	Not mentioned	Not mentioned
Source	Placcaet ende Ordonnantie, beroerende het maken, keuren ende branden van de Haring-tonnen, 1619 ²¹¹	Placcaet ende Ordonnantie, beroerende het maecken, keuren ende branden van de Haring-Tonnen, 1699 ²¹²

Other specifications of herring casks were mostly regulated by provincial authorities (Table 5.2). Urban craft guilds had less authority to prescribe the specifications of herring casks than they did of beer casks; coopers in various cities in Holland and West Friesland that were connected to the herring fishery had to comply with provincial specifications. Herring casks, in the main, were required to have at least 12 or 13 staves. The staves of herring casks were, with a minimum width of 0.9 cm, narrower than the staves used in beer casks by more than 1.4 cm. Additionally, new hoops had to be used, and reusing old hoops was mostly prohibited.

5.4.2 Enforcing cask specifications

Urban and guild councils were responsible for overseeing the enforcement of legislation concerning beer and herring casks. To this end, they used various instruments to measure the dimensions of casks, new and used, at weighing houses located in the coastal cities of the Netherlands. Several gauge instruments used to check casks appear in the painting *Amsterdam Coopers and Wine Merchants' Guild with Coopers*, shown lying on the floor (Figure 5.4).

²¹¹Published in: Jacobs, 1619, 1 – 20.

²¹²Published in: Beman, 1699, 1 – 26.



Figure 5.4: Gauge set showing the bracket and ring on the floor in front of the table and the caliper behind the cask (*The governors of the Amsterdam coopers and wine merchants' guild* [Oil on canvas, Inv. no. SB 5402], by Gerbrand van den Eeckhout, 1673. Amsterdam Museum, The Netherlands.

The artefact collection at the Amsterdam Museum includes gauge instruments that were used in Amsterdam's weighing house. These instruments can be categorized into three distinct types (Figure 5.5):

- Gauge set. It consists of a ring, bracket and calipers that were used to measure the diameter of the cask at the top and at the bilge, as well as the height of the cask and the correct position of the heads within the staves.
- Croze gauge. This instrument is specifically designed to gauge the diameter of the top of the cask and its height.
- Gauge plank. The cask was placed on the plank horizontally and vertically to gauge the height of the cask and the diameter of the bottom of the cask, respectively.



Figure 5.5: Left: Gauge caliper, middle: croze gauge, right: gauge plank (left: *Schuif el* for herring cask [inv. no. KA 9532], 1722. Amsterdam Museum, Amsterdam, The Netherlands; middle: *Kroos el* for herring cask [inv. no. KA 9533], 1722. Amsterdam Museum, Amsterdam, The Netherlands; right: Measuring plank for herring cask [inv. no. KA 9972], Unknown date. Amsterdam Museum, Amsterdam, The Netherlands; The casks used in all of the three examples: Half herring cask [inv. no. KA 9921], unknown date. Amsterdam Museum, Amsterdam, The Netherlands).

Beer casks

The gauge instruments from the Amsterdam Museum provide insight into how the required specifications of beer casks were checked to ensure compliance during construction. The cask type for which the instrument was designed and the year and city in which it was commissioned are etched into the tool. It is notable that on the gauge instruments for beer, the city is etched next to the type of cask. This underlines the possibility that beer casks from different cities differed in size. However, the gauge instruments in the Amsterdam Museum's collection were used to monitor beer casks made by the specifications of the city of Dordrecht, and consequently, a comprehensive comparison between cities based on these gauge instruments is not possible. The specifications of casks from Dordrecht can be traced diachronically from 1658 to 1801. The cask specifications were consistent throughout this period. For instance, the lengths of beer cask staves show only minor variation, measuring 82.1 cm in 1658 and 82.6 cm in 1801 (Table 5.3).

Table 5.3: Specifications of Dordrecht beer casks calculated using the gauge instruments from the Amsterdam Museum. The capacity was calculated using the formula for the calculation of a cylinder: $\pi \times r^2 \times h$. To incorporate the height of the cask, the distance between the crozes was included in the formula. To account for the curvature of the cask, the averages of the maximum and minimum radiuses were used. The inventory numbers of the instruments are those of the Amsterdam Museum.

Type of cask	Year	Text on gauge instrument	Length of staves	Croze distance	Max. Ø (cm)	Min. Ø (cm)	Capacity (L)	Inv. No.
Beer cask	1658	A:1658 XXX DORTSE BIER TON BESLAAT 15 DUYGEN	82.1	71.1	58	56	56	KA9500, KA9501, KA9508
1/2 beer cask	1658	A: 1658 XXX DORTSE BIER 1/2 VADT	68.8	61.5	45.5	43	43	KA9502, KA9503, KA9508
1/4 beer cask	1658	A: 1658 XXX DORTSE BIER 1/4	57.0	49.5	35.5	34	34	KA9504, KA9505, KA9508
1/8 beer cask	1658	...TSE BIER 1/8 TON	48.4	40.9	27.7	26	26	KA9899, KA9508
1/8 beer cask	1769	XXX A1769 Dortse bier 1/8 ton	42.8	40.8	27.8	25.5	25.5	KA9506, KA9507, KA9509
Beer cask	1801	A 1801 Dortse bier el	82.6	71.5				KA9964
1/2 beer cask	1801	A 1801 Dortse bier el	68.3	61.0				KA9964
1/4 beer cask	1801	A 1801 Dortse bier el	55.0	46.5				KA9964
1/8 beer cask	1801	A 1801 Dortse bier el	41.8	37.5				KA9964

Herring casks

The gauge instruments at the Amsterdam Museum also provide insight into the specifications of herring casks from 1658 until the 19th century (Table 5.4). Additionally, the museum's collection includes three intact herring casks²¹³, which likely served as the standard by which herring casks were measured at the weighing house in Amsterdam. Unlike the gauge instruments used for beer casks, the ones used for herring casks do not bear inscriptions indicating the city in which they were used. This suggests that the dimensions of herring casks measured in Amsterdam were widely adopted.

213 Amsterdam museum, KA 9920, KA 9921, and KA 9922.

The oldest gauge instrument that enables the calculation of cask capacity dates from 1722.²¹⁴ Its capacity of 120.7 L closely aligns with the prescribed capacity for herring casks mentioned in archival sources. The inclusion of an intact 19th-century herring cask²¹⁵ in the collection, with a capacity of 119.9 L, suggests that the capacity measure remained consistent in the 18th and 19th centuries.

Table 5.4: The specifications of herring casks in Amsterdam calculated using the gauge instruments from the Amsterdam Museum. The capacity was calculated using the formula for the calculation of a cylinder: $\pi \times r^2 \times h$. To incorporate the height of the cask, the distance between the crozes was included in the formula. To account for the curvature of the cask, the averages of the maximum and minimum radiuses were used. The inventory numbers of the instruments refer to the Amsterdam Museum.

Type of cask	Year	Text on gauge instrument	Length of staves	Croze distance	Max. Ø (cm)	Min. Ø (cm)	Capacity (L)	Inv. No.
Herring cask	1658	B XXX 1658 HARING TON			51.7	49.1		KA9524, KA9525
1/2 herring cask	1658	1658 1/2 HARING VADT			40.5			KA9903
1/2 herring cask	1658	1658 1/2 HARING VADT			40.5			KA9527
1/8 herring cask	1658	B 1658 HARING 1/8				24.5		KA9530
1/8 herring cask	1658	B1658 XXX HARING 1/8				26.6		KA9531
Herring cask	1722	17 XXX 22 HARING EL	71.4	65.1	49.6	47.6	120.7	KA9533
1/2 herring cask	1722	17 XXX 22 HARING EL	57	50.5	40.1	38.6	61.4	KA9533
1/4 herring cask	1722	17 XXX 22 HARING EL	44	39.5	29.9	28.5	26.4	KA9533
1/8 herring cask	1722	17 XXX 22 HARING EL	35.5	30.5	24.4	23.2	13.5	KA9533
1/4 herring cask	1722	B 1722 XXX HARING 1/4						KA9528, KA9529, KA9532
Herring cask	1770	B 1770 XXX HARING EL	70.4					KA9965
1/2 herring cask	1770	B 1770 XXX HARING EL	55.5					KA9965
1/4 herring cask	1770	B 1770 XXX HARING EL	44.8					KA9965

²¹⁴ Amsterdam museum, KA 9533.

²¹⁵ Amsterdam museum, KA 9920.

Type of cask	Year	Text on gauge instrument	Length of staves	Croze distance	Max. Ø (cm)	Min. Ø (cm)	Capacity (L)	Inv. No.
1/8 herring cask	1770	B 1770 XXX HARING EL	36.5					KA9965
Herring cask	1800–1900		69.5	63.6	51	47	119.9	KA9920
1/2 herring cask	1800–1900		54.5	51.5	40	37.2	60.2	KA9921
1/8 herring cask	1800–1900		33.5	29.5	24	22.5	12.5	KA9922

5.4.3 Cask specifications in paintings

An important source for determining cask specifications are paintings from the Late Medieval and Early Modern periods. They shed light on certain characteristics that are absent in archival sources, such as the number and size of holes and the number of hoops per cask. Furthermore, paintings provide information on cask characteristics that are also documented in archival sources, and can thus be considered supplementary, such as the number of staves and headboards.

Using RKD's online dataset to analyze paintings containing casks, 105 beer casks and 44 herring casks were identified.²¹⁶ They were identified as either beer or herring casks based on their visible contents or the context in which they are situated in the paintings, such as an inn or a fish market. An example of features of both a beer cask and a herring cask (with the herring still visible) can be seen in an early 17th-century painting of the Battle between Carnival and Lent (Figure 5.6). The analyzed paintings date from 1554 to 1896 and exhibit specifications that can be cross-referenced with the legislation in archival sources.

²¹⁶ Database RKD Netherlands Institute of Art History, n.d. Images. The permalink for each of the following items consists of <https://rkd.nl/explore/images/> followed by the item number. Beer: 69302; 283908; 4458; 213986; 229649; 278577; 4668; 4668; 11802; 225869; 117159; 233053; 265643; 57218; 57218; 290228; 290228; 239904; 298401; 217593; 60070; 37837; 199782; 259744; 199199; 199211; 5478; 203680; 8050; 19140; 199804; 199842; 199848; 199775; 199789; 213653; 214299; 186007; 232082; 53928; 102799; 45693; 121195; 105198; 110347; 35163; 102521; 276157; 276158; 276160; 275614; 306258; 191422; 69843; 274171; 56366; 196863; 241341; 281224; 67551; 27097; 193487; 286178; 228311; 201979; 209910; 242323; 193431; 102368; 59859; 290440; 241087; 305300; 263211; 231964; 290108; 6076; 69481; 303256; 301495; 224450; 62856; 107370; 247498; 276174; 285154; 260773; 205041; 303537; 6528; 6383; 24844; 1042; 227955; 19426; 308253; 257026; 206615. Herring: 103056; 121618; 106892; 30922; 253392; 114259; 202737; 102090; 69302; 105742; 25489; 270017; 281776; 246652; 246844; 308190; 107794; 203737; 60266; 239117; 239117; 239117; 239117; 252144; 254827; 254827; 227828; 253392; 114149; 246844; 233603; 107169; 246785; 258013.



Figure 5.6: On the left, a beer cask, identified as such because of its association with meat and waffles, is part of Carnival. On the right, a herring cask, along with ecclesiastical figures, is illustrative of Lent, a period of fasting (*The Battle between Carnival and Lent* [Oil on panel, private collection], by unknown artist, follower of Pieter Bruegel, 1600–1625. Database RKD Netherlands Institute of Art History, n.d., <https://rkd.nl/explore/images/69302>).

Of the 105 beer casks identified in the paintings, 48 were visible in such a way that 40% of the cask could be seen. This resulted in an average number of 5.9 visible staves per beer cask (Table 5.5). The average number of visible staves of herring casks was 5.7 (on 20 out of 44 casks identified in the paintings). These findings align with the 1606 legislation on beer casks in Dordrecht, which specified that a beer cask should consist of a minimum of 15 staves (Table 5.1). It should be noted that since the casks in the paintings are depicted from a single perspective, only 40% of the staves are visible. The same legislation from Dordrecht prohibited a head of more than three components (Table 5.1). The beer casks in the paintings were in compliance with this legislation in most cases. Only three beer casks had heads of more than three components.

The presence of holes in casks, often absent in archival sources, can be considered a distinguishing feature of casks intended for specific products. Among the 105 beer casks depicted in paintings, a total of 96 holes were shown. Similarly, among the 44 herring casks depicted, 29 holes were visible. These holes can be categorized as bungholes, tap holes, ventilation holes and sampling holes (Figure 5.7).

Table 5.5: Number of stave and headboards of casks in paintings.

Number of staves	Beer (105 casks)	Herring (44 casks)
Number of casks on which one side of the casks is completely visible	48	20
5 staves	21	13
6 staves	16	2
7 staves	8	4
8 staves	3	1
Average number of staves	5.9	5.7
Number of headboards		
Number of casks of which at least one head was visible	13	2
1 headboard	7	0
2 headboards	1	0
3 headboards	2	1
4 headboards	1	1
5 headboards	2	0
Average number of headboards	2.2	3.5

Both herring and beer casks had bungholes. These holes were used to fill and empty the cask, and they also provided access to the cask for cleaning the interior. In herring casks, 87% of the bungholes were round. In beer casks, about equal numbers of holes were square or round (Table 5.6). There was no specific period in which either round or square bungholes were used in beer casks; they both appear continuously throughout the Modern period.

The relatively higher occurrence of square bungholes in beer casks may be linked to differences in functional demands and maintenance practices compared to herring casks. Beer casks were likely reused more frequently, requiring more intensive internal cleaning to maintain hygiene and product quality. The larger, square openings may therefore have facilitated easier access for cleaning, scraping, and inspection of the cask interior than round bungholes. Although this hypothesis is plausible, it has not been specifically investigated within the present doctoral research.

Both beer and herring casks generally exhibited sets of the same number of hoops, with both types having, on average, four sets of hoops binding the staves. However, a notable difference between the two is the presence of markings on the casks. The paintings showed 13 marks on beer casks, while herring casks only displayed 3 marks (Table 5.6).



Figure 5.7: Paintings of casks with holes. 1. Square bunghole in beer cask, 2. Round bunghole in beer cask, 3. Taphole and ventilation hole in beer cask, 4. Round bunghole in herring cask. Sources: 1. Folk singers selling their songs [Oil on canvas, private collection], Jan Miense Molenaer, first half of 1630s. Database RKD Netherlands Institute of Art History, n.d., <https://rkd.nl/explore/images/217593>; 2. Banner of captain Roelof Bicker and lieutenant Jan Michelsz. Blaeuw at the brewery 'De Haan' on the corner of the Lastage (corner Geldersekaade and Boomsloot) in Amsterdam [Oil on canvas, inv./cat.nr. SK-C-375], by Bartholomeus van der Helst, c. 1640-1643. Rijksmuseum, Amsterdam, The Netherlands; 3. Peasant inn [Oil on canvas, inv. no. S527], by Frans van Mieris (de Oude), c. 1655. Museum de Lakenhal, Leiden, The Netherlands; 4. An Old Woman Selling Fish [Oil on canvas, inv. no. P234], by Gabriel Metsu, 1657-1662. Wallace collection. London, United Kingdom).

Table 5.6: Holes, hoops and marks of casks in paintings.

Holes in casks	Beer (105 casks)	Herring (44 casks)
Number of holes	96	29
Bunghole (round)	37	13
Bunghole (square)	36	2
Tap hole	21	0
Ventilation hole	2	0
Sampling hole	0	0
Number of hoops per set		
Number of casks on which all hoops are visible	65	24
2 sets of hoops	2	1
3 sets of hoops	9	2
4 sets of hoops	53	19
5 sets of hoops	0	1
6 sets of hoops	1	1
Average number of hoops per set	3.8	4
Marks on casks		
Number of marks	13	3
Marks on heads	10	0
Marks on staves	3	3

5.4.4 Casks in maritime archaeological context

Casks are common artefacts in the excavation of shipwrecks. They served as containers for merchandise, ship equipment and crew provisions. This explains why casks are found not only on merchant ships but also on fishing vessels and warships.

It might be expected that casks containing either beer or herring would be frequently discovered during shipwreck excavations in Dutch waters given the importance of these industries. However, the opposite is true. In the case of Dutch shipwrecks, only three casks can be confidently identified as having contained herring, based on the presence of herring residue inside them.²¹⁷ No beer casks have been found in this way during maritime archaeological investigations, which is not surprising given that beer would have dispersed after the ship sank.

A possible explanation for the paucity of beer and herring casks in Dutch maritime archaeology is that a significant number of casks were found disassembled, making it difficult to ascertain their original contents. Furthermore, not all content leaves detectable residue in casks. While the herring can be identified by the presence of fish bones, the remnants of liquids such as beer or wine are not easily traceable.

On the 16th-century shipwreck OM11, also known as the *Biddinghuizer Colfschip* because of the discovery of 16 remarkably well-preserved golf clubs on board, three casks containing herring bones were recovered (Figure 5.8; Table 5.7). One is a full herring cask and two are quarter casks. Based on archival legislation and the gauge instruments used for monitoring, we know that the prescribed capacity of a full herring cask was 120 L, which coincides with the capacity of the herring cask found on the *Biddinghuizer Colfschip*.



Figure 5.8: Herring cask OOM11_1 from the *Biddinghuizer Colfschip* (Lauwerier & Laarman, 2008).

²¹⁷ Database Maritieme opgravingsdocumentatie, n.d.

Table 5.7: Specifications of beer and herring casks recovered from the *Biddinghuizer Colfschip*.

Ship-wreck	Cask identification	Cask type	Date of wreck	Height of cask (cm)	Max. Ø (cm)	Min. Ø (cm)	Thickness of staves (cm)	Capacity (L)
OM11	OOM11_1	1/4 herring cask	16th century	41.5	31	28	1.1	24.6
OM11	OOM11_2	Herring cask	16th century	73	51	44	1.1	119
OM11	OOM11_3	1/4 herring cask	16th century	42	31	28	1.1	24.6

5.5 Conclusion

Studying the source types used in this chapter in tandem provided insight into the identification of 15th–18th-century beer and herring casks. Data concerning cask construction was derived from archival legislative sources produced by authorities ranging from the Habsburg Empire to provincial authorities to urban councils. Gauge instruments from the Amsterdam Museum were used to create the dataset on the monitoring of specifications of casks. Beer and herring casks depicted in paintings and recovered at maritime archaeology sites were studied in order to gain insight into casks that were being used. Each type of source offered valuable insights into casks from specific timeframes within the research period, and a unique set of cask specifications was derived from each source type (Table 5.8).

The data on cask specifications garnered from legislation, museum artefacts, and artwork and shipwrecks corroborate each other for the most part. For example, a capacity of 120 L for herring casks was consistently documented in archival sources from the Late Medieval period throughout the Early Modern period. The standard 120-L capacity for herring casks was first instituted in the 15th century in the coastal region of the Netherlands and remained in place for several centuries. This capacity measure was also verified by one of the 1722 gauge instruments from the Amsterdam Museum (Table 5.4).²¹⁸ Additionally, the only full herring cask discovered in the *Biddinghuizer Colfschip* also had a capacity of 120 L (Table 5.7, OOM11_2). Unlike herring casks, beer casks from the coastal region of the Netherlands varied in volume throughout the Late Medieval and Early Modern periods.

There are several explanations for this disparity. Herring from Zeeland and Holland were marketed collectively; consumers bought herring from a province and not from a specific city such as Enkhuizen or Rotterdam. As a result, herring producers were more amenable to standardization. Conversely, a beer's reputation remained closely tied to the city or brewery of origin, much like it is today.

²¹⁸ Amsterdam Museum, inv. no. KA9533.

Additionally, there was a broader array of beer types, such as *kuit* beer, *hop* beer, and *gruit* beer, each associated with specialized breweries. This diversity in beer types prevented interregional and national standardization of beer casks.

Table 5.8: Types of sources used to determine timeframe and specifications of beer and herring casks.

	Legislation: Archival sources from large, re- gional jurisdic- tions	Legislation: Archival provincial sources	Legislation: Archival ur- ban sources	Enforce- ment: Museum artefacts	Casks in use: Paintings	Casks in use: Ar- chaeology
Timeframe	1423-1900	1481-1900	1392-1900	1658-1900	1554-1900	1500-1900
Capacity	X	X		X		X
Number of staves		X	X	X	X	X
Width of staves		X	X			X
Thickness of staves		X	X			X
Number of headboards			X		X	X
Thickness of head		X	X			X
Timber used		X	X			X
Hoops		X	X		X	X
Holes			X		X	X

Another contributing factor is financial in nature. Herring played a smaller role than beer in the economies of provinces like Holland. Urban income relied heavily on tax revenue from beer, leading local authorities to fiercely protect their tax collection privileges. As a result, regulations concerning beer often remained the jurisdiction of urban authorities rather than that of larger administrative bodies.

This sub-study offers valuable insights into the specifications of beer and herring casks. Some of the specifications were more useful than others in identifying casks (Table 5.9). Other specifications, such as the width of staves, number of headboards, thickness of the head, and the type of timber and hoops used were found to be widespread and were of limited value in the identification process.

Table 5.9: The most distinctive features of beer and herring casks.

	Beer casks	Herring casks
Capacity	Capacity of casks differed, depending on the city of origin. Beer casks mostly had a larger capacity (>130 l) than herring casks.	120 L from the late 15th to 18th century.
Number of staves	Minimum of 14/15 staves for a full beer cask and 13/14 staves for a 1-2 beer cask.	Minimum of 12/13 staves for a full herring cask.
Thickness of staves	Minimum of 1.4 cm.	Minimum of 0.9 cm.
Holes	A round or square bung hole in the bilge of beer casks, a round taphole in the head and sometimes a round ventilation hole in the extremity of a stave or the head.	Only a bung hole in the bilge of the cask; mostly round.

A variety of source types offers valuable insights into the characteristics of beer and herring casks from the coastal regions of the Netherlands during the Late Medieval and Early Modern periods. It successfully identified several distinct features of these casks. Hopefully, this research will inspire archaeologists and historians to collect additional data on beer casks, herring casks, and casks used for other products, further enriching our understanding of their contents.

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