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...be sure you have ample food

Cooking, dishes and feasts of the viking age



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The photo on title-page is taken by the author, replica of cooking container with a lid found in Birka, Sweden. Grave number 61; clay, handmade container.

1. Prologue

*Unfortunately, Vikings didn't write any cookbook.
Anyway: be sure you have ample food.¹*

When it comes to reconstructing the history, many reenactors focus on combat activities, reconstruction of weapons, armour and combat itself or some everyday activities (crafts). The crafts are reconstructed mostly when it's required and there's not much interest in the additional activities. However, they allow us to understand the mentality, skills and difficulty of life of our ancestors in a more complex way, than focusing only on combat reconstruction.

Cooking is a common non-combat activity and it's the most reconstructed one. But it's thought to be an additional activity, a kind of alibi for people who visit festivals but are not craftsmen. It's also the most underrated activity and least known by the public. And that's – at least – pity.

In fact, food and its consumption have an important role (not only) in the social life of a modern man. And it had an even more important role then, when people needed to get all the supplies by themselves.

The goal of this study is to inform about meals and their preparation in the Viking age, kinds of food and related interesting stuff. The author hopes that this will also motivate people to think more into depth when reconstructing the history. This article is the first one from a sequence of articles focusing on food in historical context (based on the sources). The second one is going to be about eatable plants in broader context. (plants consumed in earlier period, but not proven in the Viking age – although this fact doesn't exclude them from the vikings' diet). And the last article is going to be about herbs and their (possible) usage.

1.1. Resources

Unfortunately, when it comes to vikings², we don't have enough direct evidence about food preparation and consumption. There's a little of written evidence (the sagas), but it was written at least 100 years after the end of the viking era. At first, this fact doesn't have to matter, because it's not likely that the peoples' diet had changed (in that short period of time, without any revolutionary technical or socio-economical changes). Anyway, there's really a lack of evidence and those we have, don't tell us much. Also, the oldest scandinavian cookbook is circa from year 1300 AD and it's visibly influenced by french cuisine³. On the other hand, there's a younger and much more relevant icelandic source *Libellus de arte coquinaria*.

We also have two types of archaeological finds:

a) Biological material (pollen, bones etc.)

b) Tangible culture/ finds (grates, pans, crockery, illustrations...)

As an example we can use a find from Oseberg (Norway), where food was a part of funeral equipment.

Combining the biological material, finds and written evidence, we can get a picture of what people used to consume, how the food may have been prepared and served. From what we know, it's hard to tell how the individual raw materials were combined and food flavoured.

1 I rede thee, Loddafafnir! | and hear thou my rede,
Profit thou hast if thou hearest,
Great thy gain if thou learnest:
If o'er mountains or gulfs | thou fain wouldst go,
Look well to thy food for the way.
-Hávamál, stanza 116

2 In this text, the word "viking" is used for all Norse people, even though the author knows, that it's incorrect and misleading.

3 Kristensen, M. Harpestrang. Gamle danske Urtebøger, Stenbøger, og Kogebøger (Old Danish Urte-books, Stone-books, and Cookbooks). Copenhagen: Thiele. 1908-1920.

2. Theoretical part

Apparently, people of the viking age have consumed mainly food produced on their own farms. Mostly beef, goat, milk, butter, grain, cheese, eggs and vegetables. Everything that is easy to hunt or collect may have been included.

Diet composition and proportional involvement of particular diet components varied, based on local conditions: different food was common in Denmark, different in Iceland, where the weather was much tougher. For example deer have never become a major part of Icelanders' diet, because there wasn't enough of it on the island.

2.1. Biological material

Talking about biological material we mean pollen, seeds, bones, skin and other plant and animal materials, that tell us about what used to grow where (pollen and seeds from peat-bogs and lake sediments) and what people used to consume (bones, skin, plant and animal material gained from junk heaps and kitchen waste (processed by so called midden archaeology)).

2.1.1. Plant ingredients

Consumption of plants is a certain thing, just like its diversity and width of species. There are many detailed studies freely accessible about this.

Of course, proportional involvement of individual species doesn't match (and just can't match) with the structure of the viking diet. We don't have enough evidence of some species, because they decompose quickly (beans, pea) and it's hard to distinguish them in pollen – especially brassicaceae plants (cabbage, turnip - rutabaga, charlock).⁴

Finds from Scandinavia and Denmark (Birka, Borg, Oseberg, Hedeby, Svendborg) and other areas (Jarlshof/Shetlands, Dublin/Ireland, York/England) prove many kinds of plant food⁵:

Grain: oat, rye, barley, wheat

Vegetables: celery, cress, cruciferous vegetables, carrot⁶, coriander, parsnip, turnip

Fruit: blackberries, raspberries, blackthorns, strawberries, blueberries, morus, juniper berries, apples, plums, elderberries, rose hips, rowan berries, hawthorn, cherries, tart cherries

Nuts: hazelnuts

Grain finds are well mapped and latest researches prove that its farming was really widespread and its profitability relatively high; on a farm in the locality of Asalstræti near Reykjavik, several storages with the capacity of 200kg of grain were found⁷. The most widespread type of grain was barley, especially in Denmark and Sweden. Around 1000 AD, farmers started to grow rye, although it was quite rare until late Middle Ages. In Norway, oat was also common. In Iceland, grain significantly expanded around 1150, apparently in relation with improvement of climate conditions. Wheat was found in York, Birka and Oseberg, but its expansion is not proved. The three-field system has been used: at first, rye was sown, then barley (the third year, the field was left fallow).

Barley is the main ingredience when making bread, which used to be small, thin, flat and baked over open fire⁸. It could have had circular or oval shape and sometimes it had a hole in the middle – apparently because it has been stored on a stick, which ran through those holes. The circular shape was more common, and it had circa 5 - 25cm in diameter. Due to its shape, bread has been used as some sort of "plate" for serving food; see for example the Bayeux tapestry⁹.

Leavened bread was made using sourdough, not yeast (*Saccharomyces cerevisiae*). Finds (Birka) prove, that it used to be always multigrain (barley and oat) and contained even linseeds or extraordinary stuff like sprouted peas, vicia, wild flax (*Camelina sativa*) or crushed pine bast (*Pinus sylvestris* L.).¹⁰

4 Kenward, pg 58-70.

5 Graham-Campbell, pg 69.

6 Of course, not the red one!

7 Karlsson, pg 45–46.

8 It seems, that ovens for baking bread weren't ordinary and some researchers deduce, that people started to use them when growing wheat in southern Scandinavia became more common and important and people started to bake leavened bread. (around 1000 AD)

9 Hansson, pg 65.

10 Hansson, pg 65.

Bread has been served in wealthy families and at feasts. Rígsþula says, that bread *lies in wealthy families straight* (probably meant still) *on the table on white linen table-cloth*. In next specialized article, we focus on bread, resp. its symbolism and its use as a gift for the deceased.

Indeed, majority of barley harvest has been used for brewing beer, which had a big importance and slightly different context than it has today – it used to be an essential way of storing carbohydrates for winter consumption!

Lack of grain in Iceland caused, that bread never became a main component of Icelanders' diet - people even used to dream about it and one man got a nickname "ring of butter" (*Smjör-hringr*), apparently based on his favourite food – bread with butter. Instead, grain has been diluted onto a mash.¹¹

Flour was milled using a quern-stone, it was a hard work for slaves and low-class women – *Grottasǫngr* (song of Grótti) in Edda says:

*Nv erv komnar til konvngs hysa
framvisar tvær Fenja oc Menja;
þær 'ro at Froða Friðleifs sonar
máttkar meyar at mani hafþar.
Þær at hvðri leiddar vorv
oc griotz gria gangs of beiddv;
het hann hvarigri hvild ne yndi,
aðr hann heyrþi hliom ambatta.*

*Now are come to the king's house
two prescient damsels, Fenja and Menja;
they are with Froði, Friðleif's son,
the powerful maidens, in thralldom held.
To the mill they both were led,
and the grey stone to set a going ordered;
he to both forbade rest and solace,
before he heard the maidens' voice.*¹²

Oat was used particularly for making mash (oatmeal), normally made just with water, for feasts made with milk and flavoured with butter. Eventually oat flakes have been used as an ingredient for baking bread (Hamar, Norway).

Finds of soups and various stewed meals ("Eintopf" type) contain flour, groats, vegetables (and animal content); sagas mention even sauces, cakes and salad (*Heimskringla*).

We reasonably deduce consumption of wide spectre of vegetables and herbs, which were grown in special gardens (see Saga about Hálfðan the Black: "*Once, (Ranghild) had a dream that she's standing outside in her herb garden.*"). They are mentioned in sagas several times. **Caraway**, **peppercress** (*lepidium*), **charlock**, **coriander**, **hops** and **horseradish** are known from Oseberg¹³. **Dill**, **henbane**, **agrimony** (*Agrimonia eupatoria*) and **cichorium** are known from Danelawe (York). Then **lovage**, **parsley**, **mentha** (mint), **thyme**, **marjoram**, **goosefoots** (*Chenopodium*), **angelica**, **fennel** and **garlic**.¹⁴ "Sea spinach", a red alga *Palmaria palmata*, has been a relevant source of vitamins and minerals. It can be stored for a very long time when it's dried and it is said that to be delicious. Sources directly mention **leek**; according to the sources, it has to be mixed with other herbs, cooked and served to the injured for strengthening and healing.¹⁵ Besides, St. Ólaf's saga mentions "mead with herbs".

When it comes to exotic seasoning, **pepper**, **saffron**, **ginger**, **cardamom**, **clove**, **nutmeg** and **mace**, **cinnamon**, **anise** and **bay leaves** were accessible.¹⁶ Early medieval cookbook *Libellus De Arte Coquinaria* (The Little Book of Culinary Arts) found in Dublin (written in Iceland in the beginning of 13th century) gives us evidence, that the Icelanders knew a lot about seasoning (not only the exotic one)

11 Jochens, pg 127.

12 Translation from: <http://www.voluspa.org>

13 Brøgger, Schetelig, pg 345-346.

14 Jóhannesson, pg 305.

15 St. Ólaf's saga, Saga about Harald the Cruel.

16 Brønsted, pg 102.

and have used many kinds of it. The cookbook was written in a later period, but it's not a reason to exclude it from the bibliography and research (although we need to approach it cautiously).

Vinegar (with **honey**) was used as an aromatic flavouring.¹⁷

Consumption of “icelandic moss” (*Cetaria islandica*) is also proved – in the time of destitution and hunger as a substitute of food.¹⁸ Interesting thing is, that laws in Iceland have prohibited moss, seaweed, angelica and berry collecting on someone else's land without the owner's permission; which is in contradiction with the traditional law of scandinavian countries, valid until now.

In the sagas, we can find some more mentions of plant food: In *Njáls's* saga, farmer Hoskuld leaves his farm one morning. He holds his sword in one hand, in the other his sowing sac and he goes to sow grain on his field.¹⁹ The mention in *Fóstbrœðra* saga is much more interesting; Þorgeir and Þormóð travel to the strands in the west of Iceland to collect angelica and “they succeed to get a good bundle of it”.

Even though there aren't many mentions about consumption of plant food, from many sources we know that consuming vegetables was nothing extraordinary²⁰ and we can say, popular. (For example in the *Fóstbrœðra* saga, those brothers are sent by a wealthy farmer and it may point out his personal interest in getting a harvest of such delicious food as angelica).

Other plants were consumed probably because of their healing effect on human organism, e.g. spoonwort (*Cochlearia officinalis*) mentioned in *Gretti's* saga (chapter 73); this plant is an excellent source of vitamin C and could help preventing scurvy (*skyrbjúgr*), which weren't well known to the vikings (see saga about Þorstein the White -*Þorsteins saga hvíta*, chapter 4).



Picture 1-watercress; locality: Czech Republic; author's archive

17 Pulsiano, pg 134.

18 Byock, pg. 51.

19 Sveinsson, pg 280-281.

20 Simpson, pg 57.

2.1.2. Animal ingredients

We can back up the consumption and generic composition of animal food not only with the archaeological finds, but even with the written sources; unlike plant food, in this case, the evidence is more detailed and the mentions more numerous – however the sagas usually talk about activities connected with **acquiring** this kind of food. We can see that for example in Egil's saga: *“Skallagrím was a really hard-working man and he used to have many people around him. Earlier, he had to depute them to hunt fish and birds, because he didn't have enough food for so many people. There weren't a lot of cattle, and it needed to graze in the woods. (...) There were plenty of whales, and they could hunt as many as they wanted, because the whales weren't used to contact with people.”* (chapter 30)

From the bone finds we know, that **beef, mutton, lamb, and pork** was consumed in large in viking settlements. The size of farms and the management of breeding correspond with this fact; farms with room (cowshed) for 80-100 animals are more like a rule. One half of the herd was slaughtered before reaching three and a half year, so the majority of cows could give birth to a calf and produce milk and meat at the same time. But sometimes bones of 10-year-old cows are found, these cows were used only for production of milk. Bulls were slaughtered right after reaching required weight.

Cattle was slaughtered in autumn, because there's not enough grazing outside in winter. So cattle had to be fed with pre-prepared fodder. The homesteader had to decide very wisely, how many cows (of the best quality) can he feed and how many of them he needs to kill. From this point of view, it's possible to label beef as “excess”, “unwanted remain” or “result of inability” and its value was never as high as the value of milk and dairy.²¹ In Iceland, cattle were the only animals that could be insured.²²

On the second place in terms of importance, were sheep, bred for meat, milk (and wool). Keeping in mind, that castrated rams were more common than sheep; we can deduce that meat, wool and leather were more valued than milk.²³ Ratio of sheep (and goats)²⁴ compared with cattle on farms in the viking age was relatively low. Only 1:1 or 2:1, this fact points out that sheep were much less relevant (the ratio in the end of the viking age rises up to 4:1 and in the following centuries reaches 25:1).²⁵

Horse meat also appeared on the menu as cheap and common nourishment. Research in Granastadir (a farm in the north of Iceland) showed that horses were slaughtered the same way as cattle. They were also offered to the gods and their meat was consumed during ritual feasts (which was banned after christianisation).

Pigs (*túnsvín*) were bred wildly, near the farm. And were intended to be consumed by the farmers.²⁶ They also consumed waste, so it was further utilized. That's why people in towns kept pigs as a source of food and also waste liquidators.

Of course, **poultry, geese and ducks** were also bred for meat and eggs.

From milk **cheese, butter** (both products mentioned in Njáls's saga) **curd, buttermilk** and **skyr** (soft sour yoghurt, more like today's cottage cheese or soft watery cheese) were made. Milk, resp. dairy was the really basic of diet and the main source of proteins in the early Middle Ages. Cereal food expanded slowly and overpowered dairy in the end of 9th century. Jochens²⁷ says that in Iceland, dairy was valued more than meat.

Milk itself wasn't drank often. It was rather used for making one of the products already mentioned. Those products could be stored much longer – skyr could be stored for months just as cheese or butter (both salted). Whey (a side product) could be used for conserving meat or butter.²⁸ Finds from a house in Stöng (Iceland) show, that salted butter could be stored for many years; Jochens says: „Big provisions of food were

21 The word for money or richness “*fé*” in old Norse has its etymological origin in the word for “cattle” – the animal producing milk was valuable, not the meat that could be consumed quickly – because from longer time view the meat was considered as economical loss. We can say that for the Vikings' beef was a sign of inability or failure, which is totally different from how it's seen today.

22 Jóhannesson, pg 85 and 290.

23 Short, pg 76.

24 These two are often fused into one group, because it's hard to differentiate the bones one from another.

25 Simpson, pg 142.

26 Jóhannesson, pg 85 and 291–292.

27 Jochens, pg 128.

28 Lactic acid contained in whey, slows the growth of bacteria, and works like acetic acid. This feature is also used for pickled vegetables.

cumulated by rich farmers, just as gold. In the time of reformation, bishop Hólar owned a big pile of butter (from tithes); its weight was counted to be 25 tons.”²⁹

Apart from meat and dairy, fish were also an important part of diet, especially in seaside areas and near rivers. Places rich in fish were valued, as we can see for example in *Landnámabók*: “*When Þuríð occupied a place rich in fish, she got a hornless sheep from every farmer, who wanted to go fishing.*”³⁰ It’s obvious, that fish were important especially in places with high concentration of people and at assemblies. Fish from Þingvallavatn lake in Iceland (near which the assembly took place) fed masses of gathered people. In seaside areas, fish represented even 25% of all nurture.³¹

Wild animals and birds were hunted (and their eggs were collected); for example cormorant, auk, plover, walrus, salmon and seal.

And we can’t exclude whales: *Ac on his agnum lande is se betsta hwælhuntað: þa beoð eahta and feowertiges elna lange, & þa mæstan fiftiges elna lange. Ðara he sæde þæt he syxa sum ofsloge syxtig on twam dagum.*³²

(In his own land, he can hunt whales. They’re 48 ells in length, the biggest ones even 50 ells. He said that he and 5 others hunted 60 of them in 2 days.)



Picture 3- Smoke-dried sprats; author’s archive

2.2. Tangible culture

A large number of objects directly or indirectly related to food and its consumption survived from the viking age until now, so we have irrefutable evidence of how food could be (most probably) prepared,

29 Jochens, pg 128.

30 Benediktsson, pg 186, S145.

31 Nordal, pg 97.

32 The Old English Orosius, line 39-41

consumed and acquired. The fact, that utensils haven't much changed is also very helpful. If we compare for example finds from Oseberg funeral (834 AD) with recommendations from the Swedish count Per Brahe for the housekeepers (1585 AD), we can see only slight differences through the centuries.

2.2.1. Fireplace, the centre of everything

For food preparation, Vikings used a special fireplace called "*máleldr*" (english: meal-fire). Máleldr was smaller than the central fireplace, whose purpose was to heat the house. It used to be built near the place intended for eating (dining room – *stofa*) or in a separate room (*búr pat er konor hafa matreido í*; = "room, where women prepare food").³³ This room had more intimate character than the open space in longhouse and was designated for handicrafts and storytelling.³⁴

2.2.2. Containers for food preparation

Food preparation requires higher temperature, so the containers intended for preparing food had to be made from a heat resistant material: ceramic clay, iron, bronze/brass, but also wood.

Copper and iron **pots** (german – "Gefässe aus Kupfer"³⁵) are backed up – finds from Dalarna and Birka (Sweden), Buskerund and Telemark (Norway), Gotland³⁶ – which are either genuinely hemispherical shaped³⁷ or cylindrical shape with convex bottom. They can be forged from one or multiple pieces of material. On some finds, we can see they were mended with rivets (some researchers think, that those rivets weren't inserted to mend defects but that they were some kind of adjustments to an imperfect item before usage).³⁸ The size can vary – diameter from 20 cm to 50 cm; icelandic code of law *Grey goose* (*Grágás*) says that the standardized size was 18kg, 30l and 6mm side thickness (after conversion) – but this amount of iron material would mean great richness in the viking age, so it's impossible to suppose that pots of this size were usual. Iron tripod belongs to the pot (rationally), but this kind of utensil wasn't usual at all. Only few people could afford so much iron material for occasional use while travelling – because in the house, pot used to be hanged on the beam which was carrying the roof. We can suppose that travellers could use a wooden tripod.

Flat pans and **hand-operated grates** (spirals) with long handles; **skewers** and **forks** used as auxiliary utensils but also for food preparation; and **gridirons** were also made of iron.³⁹

Considering that iron was a quite expensive material, soapstone containers (of various sizes) were common. Big advantage of soapstone is its ability to easily distribute and sustain heat. It is also easy to pierce the container and hang it on iron hooks over the fire (so it's stable and there's no risk of breaking the "handle"). Soapstone containers are also easy to fix using iron fasteners.

Of course, ceramics was also used, but it wasn't as common as soapstone containers. Pottery wasn't developed enough and in Scandinavia, the finds (mostly shards, pointing to an intensive usage of ceramic containers) are less numerous than in the rest of Europe (not speaking about Iceland, where lack of potter's clay is a known thing; only 2 finds from Iceland were confirmed to be ceramic – Vogur, Hafnir area⁴⁰). Shapes of the containers aren't unusual in any way (except the imported ones) and basically copy previous epochs. The implementation is coarse, sides of the containers are quite massive, and the thickness is not even (vikings didn't use potter's wheel and all ceramics was hand-made).⁴¹ Pots intended for cooking usually had thinner bottom, for better heat transfer⁴² and there were found even ceramic lids; there also were containers intended for being hanged directly over the fire, which had lifted edges with holes (a kind of handles).⁴³

33 Jochens, pg 130.

34 Short, pg 97.

35 Arwidsson, pg 219.

36 Thunmark-Nylén, pg 378, 381.

37 Arbman, taf. 218.

38 Arwidsson, p 227.

39 Graham-Campbell, p 81

40 Jónsson, p 50

41 Thunmark-Nylén, p 375-384

42 Arbman, taf. 233 and further

43 Arbman, taf. 248

Wooden containers made by turning can be used for cooking as well – it will be shown below.

As a curiosity, I need to mention sacs or just hanged animal skin. We can find it for example in *Ljósvetninga saga*, chapter 21: *Guðmund sarcastically says, that milk heated in a hanged skin isn't warm enough.*⁴⁴

Another curiosity is findings of items used for making dairy products. Such as wooden boards for drying curd (Lund), wooden sieves and fining agents, strainers, pails and also a butter churn (York). In Iceland we can find numerous examples of big containers for whey ripening, which were buried under the pantry floor.⁴⁵

We can't forget to mention outdoor pits in the ground. Large pits were filled with round stones and then fire was made on top of them – those hot stones were used for heating and cooking. This is mentioned for example in *Eyrbyggja saga*, chapter 54.

All those findings, their shapes and used materials give us a big hint about how food could be prepared.

2.3. Food preparation

Although there are various ways of how food can be prepared, only one of them was dominant in the viking age. By preparing food this way, most of the nutrients and flavour are preserved (unlike today), it's easy to combine a large number of ingredients, and a whole bunch of expensive utensils is not needed. The only possible disadvantage of this method is that it can be a bit time-consuming.

So, the most common way of preparing food was cooking in boiling water or stewing; these two methods preserve most of the nutrients. The first hypothetical way of cooking meat is placing it in a pit filled up with wood, water and then with heated stones (it could eventually be covered with a sod) - a variation of what's now known as Seton pot. Based on the findings, this method could be used, but it's not proven. These pits could as well be used only to heat the stones that were transferred into the house and then thrown into containers with food, so the water started boiling more quickly. Preparing food this way may seem more complicated (to a modern man) than just letting the water boil directly over the fire, but we must admit, that by cooking this way, risk of damaging the container and losing its content is almost completely eliminated. Also, the water starts to boil more quickly.⁴⁶ Using hot stones for cooking is also mentioned in sagas.⁴⁷ (findings of the pits - for example Vatnsfjord, Island) By the way, milk can be also heated this way, directly in wooden containers.

Another way of food preparation could be boiling the meat (and vegetables) with spice in a ceramic pot over open fire, by placing it near the fire and slightly changing its position over time. Also, a pot or a soapstone container could be hanged over the fire. Sure thing, metal containers are most efficient, but the food gains a particular taste and color.

Our logical assumption, which was confirmed by the sagas, is that people cooked mostly soups (as a side, yet important product of meat preparation) and mush/eintopf. Various ingredients were mixed and boiled with spice, as the findings show. Sagas also mention cooking meat during slaughter in large (shared?) houses -

44 Original: Hann dreyndi það að oxi gengi upp eftir héraðinu, skrautlegur og hyrndur mjög, og kom á Möðruvöllu og gekk til hvers húss er var á bænum og síðast til öndvegis og féll þar niður dauður.
<http://www.snerpa.is/net/isl/ljosvetn.htm>

45 Lysaght, p 126.

46 Experimentally proven by the author: cooking 1,5l of soup, it takes 1,5–2 hours for the water to boil, and it's necessary to continuously turn the container. But if we use heated stones, water starts to boil after 0,75–1h. Before inserting the stones into the soup, the author washed them in another pot with clear boiling water. It is better to hold the stones with sticks (in a mesh) while they are in the water and taking them out after some time, when they lose their efficiency. This way you can insert one stone after another. Or the soup will soon overflow...

47 *Eyrbyggja saga*, chapter 52 and 54

*sodhús*was, and a container called *sodketill*.⁴⁸ Hákonar saga góða, which tells us about the year 950 AD, says, that flesh was used for making three types of meals: meat itself, soup and eventually gravy.⁴⁹

Flesh could also be grilled, as shown on the Bayeux tapestry. Some findings of skewers also prove that (big forks were used rather for taking meat out of pots). But roasting wasn't as common as other types of meat preparation. Maybe because meat loses a lot of fat and is not done as well as cooked meat. This method used to be so rare, that author of the Strulunga saga deemed necessary to highlight, that the cause of grilling a cow over fire is that there wasn't any pot at hand.(!)⁵⁰

As the findings show, small stony ovens were used in some households. They used to be built with special technique and were never found in longhouses. They were particularly in smaller, sunken (attached, specialized) buildings. Oven like that consisted of 3 vertical stone plates, covered with another one, so the final shape was some kind of a box. On top of this box several small stones were placed. We can only speculate about additional sealing/ insulation.⁵¹ Anyway, they had to accumulate and maintain warmth effectively. Red hot stones heated in a fireplace outside the building were used for heating up the ovens – so there wasn't any fire, smoke and ashes inside of the building. There've been found stones and ovens cracked by heat in settlements from the viking age. How these ovens were used is still a bit mysterious; cooking in pots is unlikely, regards to bad access into the oven and the fact, that putting the pot straight into fire is more practical. Cooking on baking trays is possible - the meat stays tasty and juicy (but the author doesn't know about any plate findings). The trays could also be used for roasting (cereals).⁵² Small oven found on Shetland Islands presumably served for cooking fish.⁵³

Frying on pans over fire was also possible; there are some findings of circular pans with short lifted edge and long handles or spiral-like hand-operated “grills”. Both of these instruments were also used for baking flatbread.

We can assume, that vikings used to bake on flat stones over/beside the fireplace or cooking split open fish attached to halved logs or wooden boards by wooden chips. But these common ways of food preparation are just conjectures and the author thinks, that they were used rather for individual needs (for example while grazing etc.) because these ways of food preparation are not as effective as other ways listed above.

Preparing the food was a women's job; men provided them with ingredients, slaughtered the cattle and women then processed the ingredients (and also portioned the meat); in Njáls saga, Gunnar is being told by his wife “not to get in the way of cooking, because it's not for men.”⁵⁴

48 Jochens, page 150.

49 chapter 18., “The next day, when the people sat down to table, the bondes pressed the king strongly to eat of horse-flesh; and as he would on no account do so, they wanted him to drink of the soup; and as he would not do this, they insisted he should at least taste the gravy;...”

50 Jochens, page 131.

51 Milek, page 102.

52 Author plans to reconstruct oven like that and experimentally cook in it.

53 Graham-Campbell, page 124.

54 Njál, 12.48:124



Picture 4 - roasting a hare in a stone chimney fireplace with low reflective surface - based on those found in Iceland; author's archive

2.4. Food consumption

Numbers of various items and mentions in sagas are related to the phase, that comes after cooking – food consumption itself.

There are several findings of spoons (various materials used), wooden plates and bowls (rectangular or round, shallow or deep), metal or soapstone bowls and small butter knives. Although there are plenty of findings, they can't tell us how people used to dine; we just know what equipment was used.

Vikings had two big meals per day: first "*dagmál/dagverður*" - day-meal, which was served in the morning after they got down to work and then "*náttmál/náttverður*" - night-meal, served when the work was done. Both dishes could be served around 7-8 o'clock in the morning and evening.

The food was usually consumed inside houses, richer families sat by the table, which had to be unfolded and then folded, before and after every meal. That's because houses used to be too narrow for the table to be placed there permanently. What this semi-permanent table could look like is a subject of speculation, but there's a very strong opinion,⁵⁵ that it was hanged under the ceiling and then took down and attached to collapsible trestles (maybe the trestles could be always attached to the table – there was plenty of space under the ceiling). And after the meal, table was hanged under the ceiling beams again, so it didn't hamper. People by the table sat on tripods or wide benches that were intended for sleeping and fringed the sides of the house. Not very wealthy families didn't always have all the furniture, but they did the best they could.

Richer families had a special section of the longhouse or a separate room for eating (see chapter [2.2.1.](#) above): the table was placed there permanently and benches (*bekkr*) were around it. These benches were higher and narrower than the ones intended for sleeping.⁵⁶

⁵⁵ Foote, pg 159.

⁵⁶ Short, pg 97.

2.5. Food conservation and storing

The sagas don't tell us much about the food itself, but they do mention warehouses (*útibúr*) several times – not because of the food, but most importantly because it used to be the only place that was locked up (various stuff was stored here besides the food – weapons, ropes, whetstones etc.). Usually it was a separate building.

Big farms had several warehouses⁵⁷ and each had its special purpose and designation (*gervibúr* = a room for weapons, *söðlabúr* = a room for saddles, *skyrbúr* = a room for skyr). And then there is "*matbúri*" which can be translated as a pantry.⁵⁸ Due to huge production, big farms needed a special storage for dairy products, especially curd. From the designation "*suðrbúr*" (=southern room), we can conclude, that this place was intended for fermentation of stored food, because it was naturally warmer. It was very common, that warehouses were built on elevated and dry spots, farther from the main house. And were watched over at night-time. Hávarðar saga Ísfirðings mentions, that Alti, an Icelandic man owned a warehouse in Otrádalur; "this warehouse was filled up with all kinds of good stuff. There were heaps of goods, all kinds of meat, dried fish, cheese and anything anyone would ever wish for."⁵⁹ Alti himself was really proud of it and he used to sleep there with his wife every night.

The sagas don't mention how and in what types of containers the food was stored, and the findings don't tell us much either; curd and whey were stored in wooden vats (*skyrker*, *sýruker*), which were so large, that even a grown man could fit in them⁶⁰; cereals were kept in underground storages; meat in barrels, marinated in whey⁶¹ or hanged under the roof, where it could also be smoke-dried.

For conservation of the food, only a few basic methods were used:

Smoke-drying – particularly meat and fish; some farms had small specialized buildings for that – smokehouses (Granastaðir, Iceland). If not, meat was probably just hanged under the roof in a longhouse - because of the absence of flues, there were good conditions for smoke-drying.

Drying could be fine for meat, especially fish; fish was gutted, cleansed and then a stick was put through its abdomen, so it stayed open; the fish was hanged by the tail on a windy place. Cold and dry wind of the northern areas dried it completely and protected it from degrading.

This method could be used for fruit (maybe vegetables) and herbs as well.

Marinating in whey, mentioned in chapter 2.1.2., was suitable for meat and even butter, which was quite salty itself. Or whey could be poured into casks crammed with curd (to slow down its ripening and prevent contact with air).

Preserving meat in salt was a known method at the time, but it seems to be less common – maybe because of high prices of the salt (the salt can be re-used multiple times, but a big amount of it is needed at once).

To sum it up, we can say that thanks to chilly and windy climate, food conservation wasn't such a bother as in warmer areas. Fermentation and drying could be done easily and successfully, and even storing for example vegetables wasn't as complicated.

2.6. Feasting

One of the main problems of interpreting rituals is that despite period sources, ethnographic and folkloristic materials, their form and importance can't be described and assessed irrefutably. It's the same when it comes to feasting – a ritual, that is inherently connected with viking culture and viking longhouses. This fact is proven by archeological findings of specific skeleton sets.⁶²

57 For example houses in Iceland:

<https://floasche.wordpress.com/2014/01/20/dating-eddic-poems-the-archaeological-way-skirnismal-and-vafthrudnismal/>

58 Jochens, pg 131.

59 Jochens, pg 132.

60 For example a finding from Ströng, south of Iceland, where 3 wooden vats, with 1,4m diameter and partially embedded in ground were found

61 Dineley & Dineley

62 Jochens, pg 22.

Ritual feasting is – as the name implies – collective and social activity linked with consumption of food and beverages, shows some formal aspects and is held because of widely known reasons (habits). One of those verifiable reasons could be birth of a child, wedding and funeral:

- Danish word *barsel*, which comes from old Norse word *barnsöl* (=children's beer) - that leads us to a conclusion, that vikings drank to the health of a child and its mother; but direct evidence is found only in younger period.
- A synonym for wedding is *drekka brullaup* – toast a wedding
- After death, the deceased was praised by drinking *erfiöl* – heir's beer – which was provided by inheritors and by this ritual they inherited their belongings.

Another opportunity to feast is related to men, who went on long and important expeditions; so there were two feasts - *brotferðaröl* (saying farewell) and its opposite *fagnaðaröl* (welcoming). These rituals were also the time for playing games.⁶³ Another opportunity was the end of farming work in autumn – harvest (*haustboð*);⁶⁴ plus at this time of year there were plenty of various types of food.

These feasts were worth recording, mainly because they were connected with drinking, which wasn't as common as eating. Drinking (*drykkja*) became a synonym for feasting and in majority of sources it's about describing consumption of alcohol.

The situation varied in different areas and climate had a huge impact on that: sagas describe feasts in Iceland as full of games and fun, but in Norway it's more about uncontrolled drinking itself; it was easier to get booze in Norway, so drinking was a dominating way of having fun.

If we want to see bigger differences in drinking, than those determined by climate, we can have a look at men's and women's roles during feasts and drinking; although men dominated, even women weren't excluded. But their main task was to serve feasting men, which is traditional women's role in germanic tribes (later unhappily adopted by Huns, as Alti's case shows) and has roots in the oldest rituals. Women identified with Valkyries, serving warriors in Valhalla. The author hopes fervently, that it was important, appreciated, ritual role, not just some "maid-like job". According to the tradition, it was always host's daughter who brought a drink for incoming guest.

In spite of their important task, women weren't deprived of fun in any way; however playing their part while drinking is not as clear. Edda (for example Loki's wrangling – *Lokasenna*) indicate that gods and goddesses feasted together. In human company, women had an opportunity to drink in so called "couple drinking" (*tvímenningr*), which – of course – wasn't lone drinking, but a ritual mentioned by Snorri Sturluson – a fact, that during feast a couple (a pair) shared one drinking horn. This tradition could have a reasonable explanation; Men drew lots and then a woman was assigned to each one of them (if there was lack of women, excessive men drank alone), to prevent flirting and pangs of jealousy. Every important man spent the feast in company of one woman and she couldn't talk with anyone else (for example Egilssaga). Obviously, those habits varied from court to court. Jiří Starý says, that "According to law, vikings had to drink together on feasts (*drekka sveitardrykkju*). Even in kennings, woman is described as adornment of the feast": "the props of the gobelins", "slender, snow-white pine of the lofty baldachins", "linden of the benches" or – the oldest and exquisite kenning "belted hind of the benches".⁶⁵

Important discussions over some tipple occurred without female company; it was considered a good treat to drink without restraint (*úsleituliga*) and it was impossible to say no to offered drink. And those who tried to avoid drinking or drank too little had to drink an extra penalty cup⁶⁶ (*vítishorn*); only age and illness could be an excuse. The word *kappdrykkja* proves, that drinking was even a thing to compete in (kapp=competition, drykkja=drinking).

There are some archeological findings – mostly animal bones – that give us evidence about feasting, but their biggest flaw is, that they are often small and not researched properly. But there are some satisfactory sets of bones from Iceland - settlements Hofstaðir, Hrisbrú or Granastaðir. These findings give us evidence, that young animals were killed during feasts (Granastaðir). However, this fact is in contrast with the arrangement of bone sets from everyday consumption. Despite higher price of such meat, it was seemingly offered as something high-quality, rare and representative.

63 Jochens, pg 106.

64 Allgemeine Encyklopädie der Wissenschaften und Künste, pg 134.

65 Starý

66 This ritual is still performed in Anglo-Saxon areas, known as sconcing.

<https://en.wikipedia.org/wiki/Sconcing>

Another evidence of collective feasting are finds of big storages and specialized buildings like sheds and equipment intended for cooking – at some farms, there could be 3 big (cooking) fireplaces running simultaneously (Hayden 2001).

From the list of evidence, we can't exclude big houses. Feasting people had to be seated in a heated house during wintertime, so the size of the building is closely related to the host's social status and reputation, because it shows how many people can fit inside and how wealthy he is.⁶⁷ As an example, we can use Skallakot longhouse in Iceland, which is 31m long and 5.8m wide⁶⁸ and is interpreted as a house intended for ritual feasting – although more detailed research is needed.⁶⁹

2.7. Food composition - nutritional analysis

One of the key questions about studying food of the viking era is how it affected people's health and productivity – so it's basically studying the food's diversity and how much energy, minerals and vitamins it provided.

There is only one research known to the author – work of Hurstwic⁷⁰ group, so this chapter is based on it and is complemented with author's own research.

The base discovery is that viking diet contained enough vitamins to cover a person's daily intake and prevent illnesses caused by lack of vitamins, even in wintertime. However, for example daily intake of vitamin C is slightly lower (40 mg) than today's standard.

Surprisingly, the main flaw of viking diet was really low energy intake (based on portions consumed now). Daily energy intake was cca 1200 Kcal (5 MJ), and that simply couldn't be enough, especially in wintertime. A modern person needs 5 – 6000 Kcal for normal work (and extra 1000 Kcal when doing some sport). And also, there's a massive difference between what we call "work" and tough, physical work on medieval farms; author's estimation is that daily energy intake should be approximately 9000 Kcal, to maintain good health, condition and to correspond with the physical work. So, there's only one conclusion: The quantity of consumed food had to be enormous, much more bigger than today, regards to its (in general) lower energy content.

To consume this amount of energy, vikings would have to eat 1kg of cereals, 0,5kg of fruit, 0,8 of dairy products, 0,4 of fish, 0,7kg of meat, 0,5 of vegetables, and 3l of beer – which seems impossible nowadays. But with such a balanced diet, vikings would exceed (recommended amount of minerals and vitamins) and their health would be excellent. After all, even archaeological findings prove, that there was a low rate of physical afflictions.

67 Jónsson, str. 23.

68 Anyway, Hofstaðir is the biggest, with his size of 33 x 6,6 m. It is in Iceland, Mývatnssveit area.

69 Jónsson, pg 23.

70 www.hurstwic.org

2.8. Summary

The conclusion resulting from theoretical part of this study is clear: During viking age, various food was consumed and prepared several different (tasty) ways. Diet was balanced and high-quality ingredients were used. Taste and miscellaneous menu were also important (spice, herbs, veal meat). As said in St. Olaf's saga (chapter 33): "King Sigurd entertained them, day about, the one day with fish and milk, the other day with flesh-meat and ale."⁷¹



Picture 5 - Replica of iron pot from Buskerund, Norway; author's archive

71 <http://www.sacred-texts.com/neu/heim/08stolaf.htm>

3. Practical part

3.1. Recipes

Following recipes are not meant to reconstruct real historical dishes (which is impossible), they're more like a combination of known period ingredients, known (possible) methods and good taste⁷² - sometimes, the combinations may seem a little weird for a modern person; that's why there are listed some specific recipes, that should enrich reenactors' cookbook.

All recipes were invented, prepared and repeatedly consumed by the author; his inspiration was various literary, archaeological and culinary sources and also his long experience with cooking outdoors⁷³ – as well as his desire for experimenting and intuitive cooking. Still, historical authenticity has a big importance.

Last but not least, the author picked less known recipes, so they can diversify and complement modern person's diet. They can also inspire, bring excitement for experimenting with basic ingredients and incite to cook (and use less semi-finished products and glucoside-based flavourings) - not only on reenactment events.

3.2. Soups

Nettle soup

- 4 handfuls of nettles (preferably fresh)
- tablespoon of butter
- 2 tablespoons of wheat flour (coarse-grained, semolina)
- thyme, chives, marjoram
- 4 eggs

Chop the nettles onto small pieces and put them in boiling water, as well as the herbs and butter. Boil (bubbling) for cca 30 minutes. Mix wheat flour with a small amount of cold water and slowly add it in the soup, stir steadily. Beat the eggs and mix the egg whites directly in the soup. Then put whole (uncracked) yolks carefully in the pot (poaching). Boil for 10 more minutes. Add salt. In the beginning of cooking, you can add chicken offal, preferably hearts cut in halves. When the soup is done you spice it up with chopped watercress.

Beet soup

- 2 pieces of red beet (raw)
- 30g of fatty beef
- quarter of cabbage
- garlic, cumin, watercress

Dice beet and beef (the fatter, the better), add sliced cabbage and bring to boil. Let it boil approximately an hour, preferably in a pot. Then, season it with salt, ground garlic, cumin and watercress; boil for 5 more minutes.

Fish soup

- 1 smoked mackerel
- 5 tablespoons of semolina
- 3 eggs
- onion, cumin, salt, watercress, parsley

Remove the bones from the mackerel, put it into the pot, add onion and cumin; let boil over low heat for cca 30 mins. Slowly mix in the semolina, whisked eggs and seasoning; simmer for 15 more mins.

Dumpling soup

- smoked meat, preferably pork
- semolina

⁷² They're meant to be considered tasty by modern people – who are more picky, because their taste isn't affected by shortage.

⁷³ Author actively propagates woodcraft and is also a scout.

- eggs
- parsley, fennel, onion, cumin, salt

Mix smoked meat (diced), diced onion, fennel and cumin and let boil for 45 mins. Prepare the dumplings in the meantime: Mix semolina and eggs (one half of them hard boiled already) and chopped parsley. By adding more flour/eggs you can alter the texture of the dough (the outcome should be quite solid). Form the dough into round dumplings, they should be the size to fit between your thumb and index finger, when they're connected. Then add them into the soup and let boil. You can as well use pork tongue instead of smoked meat (boil it whole and then slice it), the tongue is the very tender and delicious.



Picture 6 - Dumpling soup made by author; author's archive

3.3. Porridge

Porridge is one of the most nutritious and most variable dishes – it can be sweet, salty (even sour) and you can add different types of fruit into it.

Wholemeal wheat porridge

- wheat grains
- honey
- dried plums
- milk

It's quite difficult to get the grains. Of course, gathering it on the field by yourself is the best option. You can also buy grains that are used to feed cattle, but there's nothing like a mildew control; on the other hand, organic shops sell extremely expensive food. Anyway, soak the wheat in water, preferably in a container which has holes in its bottom (at home, you can just use a PET flask, cut in half and with holes at the bottom) and rinse it several times a day, so it stays wet (make sure it doesn't get mouldy/ doesn't rot). The next day (in case you've let the grains soak) or the third day (in case you rinsed them) the grains are

enough soft and activated, so you can cook it. Before you boil it, you can crush it between two cutting boards, but it's not necessary. Boil it in water or milk (add plums) until it gets soft, it can take approximately 15 mins. And then flavour it with honey and a pinch of salt. It's an ideal and nutritious breakfast.

Sour porridge

- wheat semolina
- 2 tablespoons of sourdough⁷⁴
- chives, garlic, marjoram
- dried plums
- milk, butter

Boil semolina, sourdough and plums in milk until this mixture thickens. Then add garlic, a little amount of salt and herbs; set aside for cca 2 mins. Eventually, mix in some butter.

Authentic kyselo

- 0.5l of sourdough
- milk
- eggs
- parsley, watercress, watercress

Boil milk and sourdough for cca 20 mins, until it thickens. The texture should be similar to yoghurt. Then, mix in egg whites and poach the yolks (be careful when putting them in, make sure they don't break). Boil for 6 more mins and stir very carefully (because of the yolks). True gourmands can add some garlic or dill. Serve with smoked sprats or mackerel. This dish is perfect when consumed after feasts – when you drank too much; and it's better when the consistence is more watery.

Pučálka

- peas
- lard
- salt
- bacon
- cumin

Let the peas soak overnight (or for two nights), so it starts to sprout. And again, it's important to change the water sometimes, so it doesn't spoil. Heat up the lard and add bacon, then roast strained peas. Mix in cumin and salt and you're done. You can take this dish to another level by adding chopped parsley (root) and roasting it a bit more. You can flavour it with garlic and chives or make the whole dish sweet by adding honey.

It's ideal, when the sprouts are about 1cm long – that's when it's delicious. But it needs to be rinsed repeatedly for 3-4 days in a container with holes at the bottom.

3.4. Meat

Pork cooked in beer

Cook pork (whole piece) in beer in which you've already put parsley (root), hops (fruit) and agrimony (2 plants). I recommend spreading garlic mashed with salt over slices of cooked meat.

Lamb with mint and garlic butter

Lightly pound slices of lamb meat, then lay mint leaves on it and spatter with honey. Roll the slices and pierce it with wooden skewers. Grill them; at first, put them near the fire, but eventually, you can move them more and more over it. While doing so, grease them with melted butter with mashed garlic and honey.

Hen with leek and plums

Stuff hen with chopped leek and onion (mixed 1:1), then put it into a pot, add some water, more leek and a handful of dried plums. Boil until the meat is tender.

74 Sourdough recipe in chapter [3.5 Bread](#)

Peas and fish

Melt butter and add green peas (freshly detached from a pod or defrosted) and stew for cca 10 mins. Then, add smoked fish, any will do (sprats, herrings, roaches, perches, young catfishes or flatfish; but the fish must be smoked, not marinated in oil) Put the lid on and stew for 20 more mins; add salt and spice. This dish is best when served with flatbread.



Picture 7 - "Peas and fish" in a pot (Buskerund); author's archive

3.5. Bread

We won't be dealing with flatbread which is so typical for the viking age – because, at the end of the day, it's just flour and water. But we're going to focus on sourdough bread which represents later period (and many people don't realize that).

Sourdough bread is the oldest kind of leavened bread – yeast is used since 19th century. Unlike modern yeast bread, it's digested more easily, doesn't cause flatulence, maintains more vitamins and minerals and is overall more "living", in contrast with today's dead processed bread.⁷⁵

The first step is to start your own sourdough: mix 2 tablespoons of wholemeal rye flour⁷⁶ and water (the texture should be similar to yoghurt) and gently seal with a lid. The next day, add another tablespoon of flour and some water. Repeat this process on the third day, you should see some bubbles already (a sign of fermentation). And again, repeat this process on the fourth day as well. But in case that the fermenting mass doubles it's size, you don't have to add any more flour and water and you can just skip straight to making the bread.

To make 1kg of bread, you need to mix 200g of rye flour and 200ml of lukewarm water into the sourdough; I'd advise you to prepare this mix in the evening and then cover it with a lid or to put it into a plastic bag. In 24 hours, when the sourdough is active enough (light, bubbly mix), add 300g of bread flour (rye or wheat – depending on how "white" you want your bread to be) and 200ml of water. Mix it well and let chill for 3 hours – the flour soaks up the water and the dough will leaven easier.

⁷⁵ Author himself bakes sourdough bread for several years – the outcome is sometimes satisfactory, sometimes not.

⁷⁶ Each type of flour acts a bit different - it's determined by the mark, which sells it, but also how stale and finely ground it is. So making your own sourdough isn't as easy as it may seem.

Then, add salt, cumin a little more flour and knead/fold the dough. More hydrated (waterier) dough leavens better, is fluffier and rises way more while baking, but it's also more difficult to process. Add flour if needed and then let chill for 20 mins. For the next hour, knead it every 15 minutes or so and then, put it into flour-dusted trug (shallow basket). Let it leaven until it enlarges by one third (depending on the temperature, this should take 4-14 hours, usually 8-10h).

Put the leavened bread on hot baking tray/stone plate with a temperature of 250°C. You should sprinkle some water in your oven to make a little steam in the baking space. At this temperature, bake the bread for about 10 minutes and then air out the oven to lower the temperature (if you're baking indoors, just set it to 180°C) and bake for another 30-40 minutes.

If you're baking in a wood-fired oven, you don't have to sprinkle it with water at the beginning (because the coals are usually swept out using small wet coniferous branch or birch broom) but you have to check the bread regularly.



Picture 8- Preparing flatbread dough in a carved wooden bowl; author's archive

3.6. Desserts

Barley flat cakes

It's quite difficult to get barley flour sometimes, so you can substitute it with rye one.

Mix 3 cups of flour with 3 eggs, several tablespoons of honey, ground hazelnuts and a pinch of salt. Add milk and form easy-processable dough; form flat cakes and bake them on a pan from both sides.

3.7. Curd

Heat milk (it should be hot enough, that you can't hold your finger in it, but it's not boiling yet) and then let it cool (in a warm place). Then add a bit of already made curd or (sourdough) bread crust and let acidify in a cold room for at least 2 days. Then add rennet (whey - from previously made curd or cheese) cca half a glass for 5l of milk and let acidify overnight. The final product should be a thick sour mass. Then strain it through a piece of cloth, make a knot on it and twist the cloth, so all the whey is removed. Let it drip off for half a day, then put in between two cutting boards and weight with a large rock; let chill for another half a day in a cold place.

3.8. Cheese

- 1kg of curd
- 1l of milk
- tablespoon of butter
- salt
- eventually: peas, carrot, boiled eggs

At first, mix curd and milk and bring close to boil – the curd will start to melt and some whey will leak out of it. Then strain this mix through a piece of cloth. Put the melted curd back into the pot, add melted

butter and salt. You can add some more ingredients; almost anything is possible and tasty. Then heat the mix up again (stir thoroughly) and when it's melted enough, pour it into a mould (make sure it's even on top). Let chill in a cold place until the next day.

4. Added pictures

Photos shown below are from books listed in [5. Bibliography](#) or from author's archive.



1- Foundations of a house (kitchen) with cooking stones in fireplace; Jarlshof, Shetland Islands



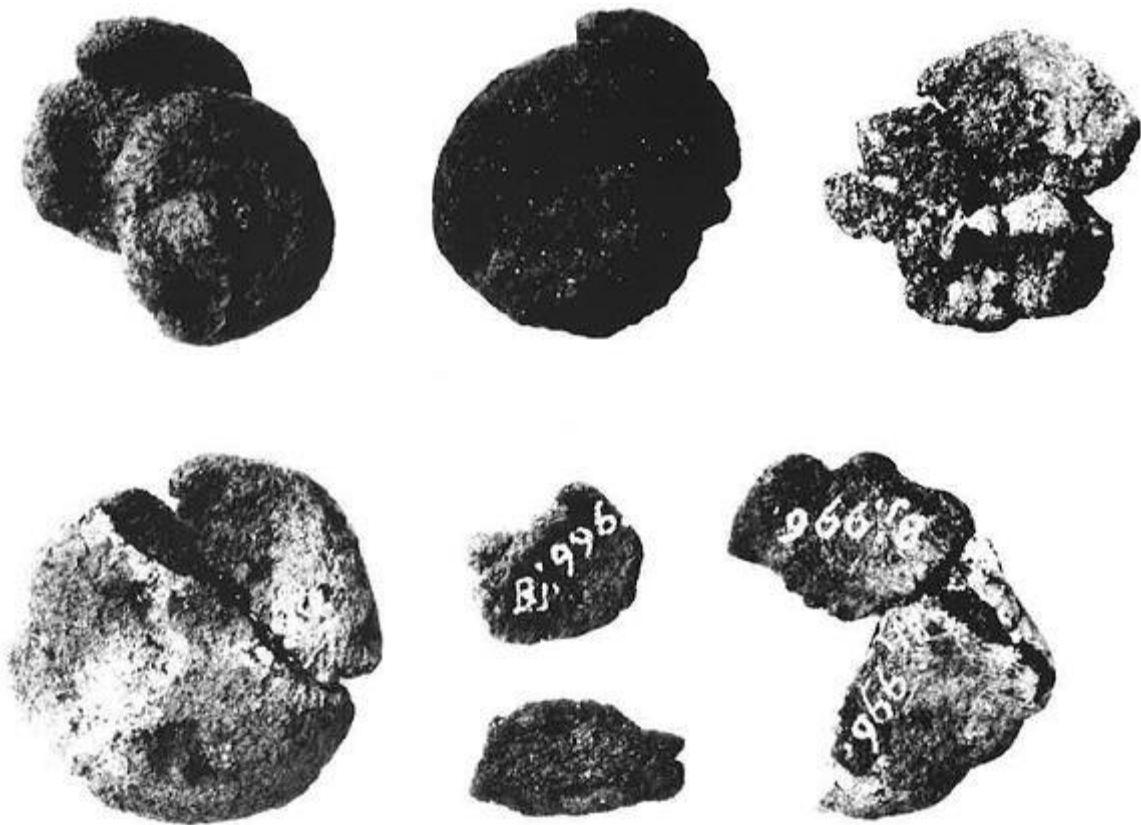
2 - Iron pot; Copenhagen, Denmark



3 - Foundations of a house with an oven; Stöng, Iceland



4- Serving (?) plate; Alt-Spandau, Germany



5 - Bread found in graves; Birka, Sweden; graves Bj 1028, 173, 391, 996, 966.



6- Hanged cooking container; Birka, Sweden, grave 667.



7- Sourdough bread, baked by author



8- Replica of a carved wooden bowl, inspired by fragments from different areas



9- Replicas of lathed wooden containers; inspired by fragments from York and other areas.



10- Replicas of ceramics; Birka; made by author

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