

Preferences in Meat Consumption of People throughout the Ages Inhabiting the Present—Day Territory of Poland According to Archeozoological Evidence

Antoni Jarczyk^{1*}, Agata Andrzejewska¹, Małgorzata Woźniak²

¹Faculty of Animal Bioengineering, University of Warmia and Mazury
in Olsztyn, ul. Oczapowskiego 5, 10–719 Olsztyn, Poland

²Faculty of Environmental Science and Fisheries, University of Warmia and Mazury
in Olsztyn, ul. Oczapowskiego 5, 10–719 Olsztyn, Poland

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This paper describes meat consumption preferences of people from antiquity inhabiting the territory of present day Poland based on archaeological evidence from the skeletal remains of domestic and wild animals. Much information is provided about meat stocks and the scale of meat consumption by various social groups from these ancient times. Skeleton remains of cattle from the Neolithic period, (estimated in Poland to be around 4600–2100 B.C.), constitute on average from 44.0 to 73.0% of all animal remains found whilst the numbers for swine remains were from 36.9 to 19.0%. Looking at the 8 regions of contemporary Poland then in pre-Roman and Roman periods cattle bone remains ranged from 37.5% in East Pomerania to 80.9% in Central Poland. Those from swine ranged from 42.3 and 11.7%, respectively. In the Middle Ages, (defined as 7–13th century A.D.), cattle bone remains constituted from 30 to 50% and those of swine from 28.0 to 52%. In all of the analysed periods goat/sheep remains amounted to 15%. The skeletal remains of horses during the Roman and pre-Roman periods reached different values in different regions, *i.e.* from 2.7 in Greater Poland to 11.3% in Silesia however in the Middle Ages they were all below 5%. Fish remains consisting of mainly herring, pike and various other species have been continuously found to be present in the diet of people from Neolithic to the Middle ages.

Nowadays in Poland the annual consumption of pork amounts to 42 kg per capita constituting 57.8% of the total meat consumption (72.7 kg), against only about 5 kg of beef.

INTRODUCTION

Based on archaeological research, it is possible to define the groups of animal species, which in the past formed the primary source of meat. Scientists working in this field have created a new subject specialisation to describe this field now termed as archaeozoology. From among osseous (bone) remains, even very fragmentary ones, it is possible to distinguish between cattle, swine, goat, sheep, dog and even poultry species, as well as amongst species of game; hares, beavers, foxes, bears, aurochs and even between particular species of fish. An evaluation of animal dentition, its state and degree of wear forms the basis in defining the age at slaughter and how specific herds were divided into age groups. The oldest individuals set the limit for the herds' utility, while their numbers per age group provide information on the slaughter frequency in any given herd. Identification of sex dimorphism allowed the sex distribution in a herd of adult animals to be determined, thus enabling interpretation of how animals were selected and exploited according to their sex. Bone measurements make it possible to reconstruct the form (shape)

of the farm animals used and to determine their types. They are also helpful in identification of the sex. Anthropogenic traits allow us to state whether the examined bones are the remains from consumed meat and for this reason they are a useful material in research on human consumption and hunting. Osteometric analysis helps to define to what degree a particular species was domesticated and it also reflects the level of breeding knowledge. It is found that various skeleton modifications that might have resulted from breeding treatments and environmental conditions [Bogucki & Grygiel, 1981], are crucial in providing a precise interpretation.

In recent years archaeological research has taken DNA into consideration as a potential tool for making comparisons with contemporary dietary proteins as well as for aiding in other issues [Ludwig *et al.*, 2006].

NEOLITHIC AGE

Archaeological research on this period is described in many countries [Ammerman & Cavalli-Sforza, 1984; Bogucki, 1982; Bogucki & Grygiel, 1980; Hodder, 1984; Marciniak, 2005, 2008; Wiślański 1979; Price *et al.*, 1996; Pollard, 1999; Starling, 1983]. Some studies have also demonstrated social, economic, technical and cultural similarities [Hodder, 1984; Marciniak, 2008].

* Corresponding author: Tel. +4889 523 36 59;
E-mail: jarant@uwm.edu.pl (Prof. Dr. Antoni Jarczyk)

Throughout the territory of present day Poland the Neolithic age lasted between 4600 – 2100 BC, [Wiślanski, 1979] and animal breeding played a significant role in the way people obtained their food. Inhabited areas and the animal remains found in settlements, (including osseous rudiments of domestic animals and game), provided evidence for the lifestyle of the resident inhabitants. Material from that period found in Poland is scarce and showed 73.3% cattle rudiments, 19.3% of swine and 7.4% of sheep residues. Surprisingly, the percentage of wild animal rudiments accounted for as little as 10.2%. Skeletal remains from wild boars were also found which did not all necessarily come from hunting; some may have been domesticated and were larger sized individuals [Wiślański, 1979]. All these animals were slaughtered in the autumn and winter-spring season where they provided meat which was later preserved by means of drying, smoking and salting. The condition of the bones, showing colourations from being smoked or being subject to high temperatures gives evidence of the technology used in food preparation. In the north-eastern parts of present day Poland, osseous remains from the Mesolithic-Neolithic age were found of which 44.0% were from cattle and 36.9% from swine. As far as game is concerned, (excluding rudiments of deer, elk and aurochs), bones were found from bear, wolf, dog and a large percentage of beaver bones amounting to 59.7% [Sobociński, 1985]. In some settlements, beaver remains accounted for as much as 77% [Wielowiejski & Makiewicz, 1981].

In the Neolithic period sheep and goats were also used as a source of meat consumption, but the marrow was not consumed after boiling or roasting [Marciniak, 2008]. This suggests that marrow could have been for a special diet or considered a delicacy.

Archaeological discoveries indicate that Neolithic and Mesolithic societies extensively consumed carp as well as sheathfish, pikes and perches [Gautier & Kobusiewicz, 1992].

PRE-ROMAN AND ROMAN PERIOD

This period overlapped with the Bronze Age, which occurred in the Polish lands between 2100 BC up to the first half of the 8th century BC. Likewise to the Neolithic Age, the slaughter of domestic animals was undertaken in the autumn thus

providing a food supply and reserves for the winter (*i.e.* salted, smoked, and dried meat). By these means people also reduced the number of animals in herds because of fodder shortages.

Table 1 presents the number and the percentage share of the osseous remains from this period found on Polish territory which shows that breeding cattle dominated at 37.5–80.9%. The next significant majority were sedentary and osseous remains of sheep and goat bones (around 15%), which taken together with the former proved that ruminants constituted the base for nutrition; a finding explained by the relative ease in which fodder is stored in the form of hay. Except for milk, butter, cheese, leather and wool, cattle provided meat and fat. In contrast breeding pigs/swine requires more resources and effort to store their fodder for the winter season. Despite this, pigs made from 11.7 to 42.3% of all bred animals. The least share of osseous pig remains was always inversely related to the highest share of cattle rudiments. According to Wielowiejski & Makiewicz [1981], investigations of the osseous remains from the neighbouring territories demonstrate that people used to borrow and adopt some eating habits from neighbouring cultures (*e.g.* Celtic). In the Latin/ Celtic period such a trend was attributed to the community occupying the left side of the Vistula River in respect to the older Celtic culture stretching from the South up to the area of Poland (Głubczyce).

EARLY TO MIDDLE AGES

This period (7–13th century AD), was marked by an increasing demand for land dedicated to pasture. People began to use wheat protein fodder even to feed cattle consisting mainly of barley and oats. During the reign of the first Piast monarchs ruling Poland, in order to guarantee a sufficient supply of meat for the needs of princes' courts, officials and warriors, some special or so called auxiliary or subordinate settlements were established, where the residents specialised in animal breeding. The legacy of such activity are the village names which have survived to this day, *e.g.* Świniary, Kobylniki, Skotniki (*i.e.* pigs, mares, cattle-breeders). Big breeding farms were also found on church estates. Live swine or pork meat was also a popular form of compulsory tribute at the royal courts.

TABLE 1. Skeleton remains structure of domestic animals in the Roman and pre-Roman period, findings in the Poland area according to regions [Wielowiejski & Makiewicz, 1981].

Region	Cattle		Horses		Pigs		Sheep/goats	
	n	%	n	%	n	%	n	%
West Pomerania	1066	64.6	60	3.6	237	14.3	288	17.5
East Pomerania	345	37.5	46	5.0	89	42.3	139	15.2
Great Poland	48	64.9	1	2.7	23	31.1	2	2.7
Kujawy	5147	53.3	519	5.4	1874	19.4	2113	21.9
Central Poland	229	80.9	17	6.0	33	11.7	4	1.4
Mazovia	892	59.7	160	10.7	226	15.1	216	14.5
Silesia	798	57.8	156	11.3	310	22.5	117	8.5
Small Poland	1551	55.0	159	5.7	711	25.2	397	14.1
Celtic settlements (South Poland)	3015	35.4	331	3.9	2581	30.3	2595	30.5

Archeozoological research has explained differences in the quality of meat consumed by various social groups. Thus in areas of castles there were more bones found coming from the more meaty parts of carcasses, (*i.e.* hams, pork joints and neck), whilst in the settlements and suburbs: knuckles, heads, tails and front limbs predominated. In towns, the majority of varied osseous remains were found in the craftsmen and merchant districts inhabited by a relatively large group of people becoming more affluent. We have very little written information about the human diet in the early Middle Ages. For that reason the description left by a Spanish traveller, Ibrahim Ibn Jacob is highly interesting, who thus described the nutrition preferences of our ancestors from the 9th century in the Polish lands: *they avoid eating chickens as these, in their opinion, knock them down and intensify the rash of "the red"; they eat however cattle's meat and geese, because it serves them good*". A certain association can be made here about the recently observed swine flu virus affecting humans which spread from domestic animals, *i.e.* poultry and cattle. So called 'epidemics' certainly affected not only people, but the animals as well. Yet, the possibilities of their transfer from the animal to the human population were recognised only until relatively quite recently.

In the early Middle Ages most pigs were slaughtered at the age of 12 months to 3.5 years. After slaughter a large volume of meat-fat mass was obtained from sows and older animals later used to produce preserved cured bacon and sausages [Wielowiejski & Makiewicz, 1981].

Figure 1 shows the percentage share of osseous remains in some regions of Early-Mediaeval Poland. This demonstrates that at the turn of the 9th and 10th centuries up until the first half of the 11th century, pork meat consumption was dominant or equal to beef consumption in the area of present day Poland. Primitive animals were characterised by a low reproduction and a long period of growth which is why they were kept breeding until a large mass was reached. Height of the examined pig's buttock remains were on average from 72.0 to 74.3 cm but among wild boars there was an individual with a hip height of 94.5 cm [Makowiecki, 2006a].

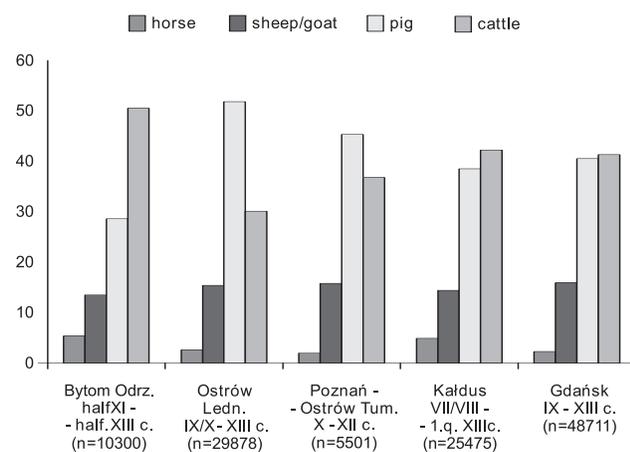


FIGURE 1. Shares of the species in the group of domestic animals on the basis of osseous findings from the selected settlements in Early Middle Ages [Makowiecki, 2006a].

Only in Bytom Odrzański were cattle bone remains more plentiful (about 21%), than the remains of swine. The situation in Poznań and Ostrów was quite the contrary where swine remains dominated.

In the 12–13th centuries however, a settlement close to Poznań shows that the remains of cattle were again more plentiful (56.8%) than for swine (28%) [Benecke, 1986]. Also beyond the Poznań area, wild animal remains amounted to 17.8% of the total. This suggests that people living in larger settlements, like Poznań or Ostrów, consumed mainly domestic animals in their diet.

Ibrahim Ibn Jacob wrote in his diary when journeying through Polish lands and others nearby *'the whole land is rich in deer, aurochs and wild horses, bears, wild boars and swine, and all sorts of game'*. Probably, this 'richness' refers to the average person's diet of that time where archaeological findings in small settlements show that hunting was an easy way to obtain food. In all findings the percentage share of wild animals was rather insignificant making up only 2.4%; birds were only 0.24% and 0.16% other animals. As much as 97.2% of all remains were connected with domestic animals. This research covered a time period of 15 hundred years and a homogeneous cultural system [Wiślański, 1979].

The medieval findings demonstrated much less beaver bone remains which had been more frequent and plentiful in Pre- and Roman settlements. Among wild animal rudiments the majority were from deer (60%) and roe deer (18.9%), while wild boars constituted only 8.4% [Makowiecki, 2006a].

Indeed, it is worth noting the estimated average body mass of the slaughtered animals. Although these calculations refer to just one location they in fact provide a rough picture of the genotype and nutrition conditions. The body mass was low. Fifty per cent of the examined animals were estimated to be aged 2–3 years whilst the half were calves killed before reaching 1 year of age. Their live weight was only 71.4 kg, for swine 32.8 kg (0.5–1.5 year) and for sheep and goats 17.1 kg (8 months – 2 years) [Makowiecki, 2006a].

In these circumstances big game such as aurochs or bison must have evoked admiration or even astonishment and fear. An interesting description depicts a gift from the Polish king Władysław Jagiełło to the German Emperor Sigmund in 1417 during an ecumenical council in Konstanz-Germany [Dembńska, 1963]. The participating bishops were presented with salted and barrelled meat from two bisons or aurochs, while the emperor received a whole carcass, disembowelled but covered in fur. The carcass was salted and rubbed with precious spices and herbs as well as... gunpowder. The magnificence of this gift was stressed by a rather grand departure from the town where a trumpeter heralded the procession of the ceremonial pageant [Dembńska, 1963].

It is also worth mentioning that remains of fish caught in the area of Rugia and Gdańsk [Zbierski, 1976] mainly herrings and most probably salted, dried or smoked were found in central Poland nearby Toruń and as far south in Poland as Wrocław. Merchant routes led even to Kiev in the Ukraine and Hungary [Makowiecki, 2001]. This was especially visible in the years 950–1050 during a 'genuine revolution of the fish trade in Europe'. It is assumed that Vikings played a major

role, or at least, according to Makowiecki [2006b] were present in this process. The bone remains consist mainly of bream, pike perche, perch and sturgeon being found in excavated Medieval layers around the town area and port of Wolin Island as well as in Gdańsk [Barret *et al.*, 2006; Filipiak & Chelkowski 2000a,b; Chelkowski *et al.*, 2001].

Some sources and materials also suggested that dogs may have been consumed [Makowiecki, 2006a; Prost, 2001; Daugnora & Makowiecki, 2006; Sobociński, 1985], however it is hard to say whether these animals, that were people's companions since the dawn of the history, were treated in any different way than those reserved for consumption. In periods of famine or due to their attributed healing properties, dogs could have been a 'special' or cult diet. As late as the fifties of the 20th century, the fat obtained from dogs or cats fat was considered an effective means in treating tuberculosis and rheumatism, which is noted also by Prost [2001].

In the remote past, animal meat was a scarce and costly commodity. A rough estimate states that at the beginning of the 20th century, in the territory of the present-day Poland, only 0.5 million pigs were bred [Kossowska & Zwolińska-Bartczak, 1999]. In 1929 when around 3.3 million pigs were slaughtered yearly, meat consumption per capita was only 19 kg including 10.9 kg of pork meat [Konopiński & Borman, 1932]. Nowadays in contrast, one inhabitant consumes 72.7 kg of meat including on average 42 kg of pork meat (57.8%), and only 5 kg of beef meat [Polish Statistical Yearbook, 2008]. Throughout the years, pigs have become the mainstay of meat production and consumption in Poland. Quite likely this has resulted from its nutritional merits and national taste preferences as well as increasing agricultural productivity ensuring the supply of grain; a principal food for human beings.

SUMMARY

The proportion of the skeletal remains of cattle have increasingly fallen from the Neolithic period to the Middle Ages as compared to swine remains. This was especially seen in large settlements while in small ones the share of wild animals during the Middle Ages amounted even to 17.8% compared to those in the large settlements which did not exceeded 3%. In all of the analysed periods goat/sheep remains amounted to about 15% but in the Celtic settlements in the south of Poland their share reached even up to 30%. During the Middle Ages, the skeletal remains of horses did not exceed 5%, however in two regions this did reach 10%. In castle areas, there were more bones coming from the more meaty parts of carcasses (*i.e.* hams, joint of pork, neck *etc.*), while in settlements and suburbs; knuckles, heads, tails and front limbs were common. Fish, mainly herring, pike and others species, were continuously present in diet of people from the Neolithic to the Middle Ages.

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