THE ARCHAEOZOOLOGY OF THE FĂGĂRAȘ FORTRESS DURING THE HABSBURG PERIOD

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Keywords: *archaeozoology, Făgăraș fortress, the Habsburg period, taphonomy*
Abstract: *The archaeozoological material discussed in this article came from one feature (Cpl. 2) located in the southern outer courtyard of the fortress investigated in the summer of 2020. The collected artefacts date mainly to the 18th and 19th centuries, therefore to the Austrian era, although some of them had been in use even earlier during the 17th century. The feature, most likely with the initial phase in the middle of the 17th century, has functioned as a latrine pit in which all sorts of remains were gradually thrown away, including faunal ones. Given that the faunal material analysed comes from a single archaeological feature, the conclusions are quite limited. Conclusions cannot be generalized, but they show a trend probably close to reality. We would like to make this clear because during the older or newer archaeological investigations, in various areas of the Făgăraș fortress, numerous animal bones were discovered, with or without a clear dating context, which could not be collected or analysed. The fauna studied in this article offers a glimpse on the diet of the human community that served the Făgăraș fortress, in general, during the Habsburg period. We observed that cattle hold an overwhelming ratio NR-wise, dominating the faunal spectrum. MNI-wise, although cattle hold second place after ovicaprids, they still have the highest importance in terms of the meat ratio, compared to other domestic animals. The game has an extremely low ratio, with medium-sized species (roe deer) and small species (hare) identified. The study of the slaughter ages and the distribution of the anatomical elements/skeletal parts in the case of the domestic animals suggest the consumption of subadult and adult animals with less tender meat, some of the animals being at the age of reform (especially the old ones) suggesting that they were part of the daily food of the fortress staff (soldiers, civilians and administration). Although not very large in terms of quantity, the importance of the sample from the Făgăraș fortress is also given by the fact that such studies of archaeozoology dedicated to the Habsburg period are extremely rare in Romania. Future archaeozoological research will certainly help us to better understand the diet of the population in the Habsburg era.*

Cuvinte-cheie: *arheozoologie, Cetatea Făgărașului, perioada habsburgică, tafonomie*
Rezumat: *Materialul arheozoologic care constituie obiectul studiului de față provine dintr-un complex (Cpl. 2) aflat în curtea exterioară sudică a cetății și a fost cercetat în vara anului 2020. Artefactele recoltate se datează cu precădere în secolele XVIII–XIX, așadar în epoca austriacă, cu precizarea că unele dintre acestea sunt utilizate și mai timpuriu, pe parcursul secolului al XVII-lea. Complexul, cel mai probabil în faza inițială începând cu mijlocul veacului al XVII-lea, a funcționat ca groapă de latrină, în care treptat au fost aruncate tot felul de resturi, inclusiv faunistice. Având în vedere că materialul faunistic analizat provine dintr-un singur complex arheologic, concluziile sunt destul de limitate. Datele nu pot fi generalizate, dar arată o tendință care probabil nu era departe de realitate. Facem această precizare deoarece în timpul cercetărilor arheologice mai vechi sau mai noi, în diverse puncte de pe cuprinsul Cetății Făgărașului au fost descoperite numeroase oase de animale, cu sau fără un context de datare clar, care nu au putut fi însă recoltate sau analizate. Fauna studiată în cadrul acestui articol sugerează dieta comunității umane care a deservit Cetatea Făgărașului în linii mari în perioada habsburgică. Observăm că bovinele au o pondere covârșitoare ca NR, ele predominând spectrul faunistic. Ca NMI, cu toate că bovinele se situează pe locul doi după ovicaprine, totuși ca pondere carnată, ele au cea mai mare importanță în comparație cu celelalte animale domestice. Vânatul are o pondere extrem de redusă identificându-se specii de talie medie (căprioru) și mică (iepurele de câmp). Studiul vârstelor de sacrificare și distribuția pe elemente anatomice/părți de schelet în cazul animalelor domestice sugerează consumul unor animale de vârstă subadultă și adultă care aveau o carne mai puțin fragedă, unele din animale fiind chiar la vârsta „reformei" (mai ales cele bătrâne) ceea ce ar sugera că acestea făceau parte din hrana cotidiană a personalului cetății (soldați, civili, administrație). Deși nu foarte mare din punct de vedere cantitativ, importanța eșantionului de la Cetatea Făgărașului este dată și de faptul că astfel de studii de arheozoologie, pentru perioada habsburgică, sunt extrem de rare pentru România. Cu siguranță viitoarele cercetări arheozoologice ne vor ajuta să înțelegem mai bine dieta populației în epoca habsburgică.*

I. INTRODUCTION

The locality of Făgăraș is situated in southern Transylvania, in a depression crossed by the Olt River, approximately halfway between Brașov and Sibiu. In the centre of the city, not far from the left bank of the Olt, there is an impressive fortress, undoubtedly one of the most important monuments of medieval architecture in Romania.

The fortress of Făgăraș, as it appears to us today, is the result of constructive activity extended over several hundred years, most probably started around the year 1300[1]. The current monument consists mainly of: the

[1] The first documentary attestation of Făgăraș (posessio Fogros) is in the year 1291 (*Urkundenbuch* I, p. 177), without being able to specify whether there was also a stone fortress at that time. See the discussion in Lukács 1999, p. 66–71 and earlier publications.

castle itself – a three-tiered building in the shape of an irregular quadrangle, with towers at the corners and an additional tower on the north side, surrounded by a fortification consisting of four massive bastions built in the "Italian manner", joined by double walls, with earth filling between them, forming an irregular trapezoid. Around the fortress is a wide defence ditch, paved and filled with water. Access to the fortress is possible through the east side through a barbican tower flanked by two guards, and further into the inner courtyard of the castle it enters through another barbican. Over time, the monument has undergone a series of modifications, restructurings and restorations that gave the current appearance of what we call the Făgăraș fortress (Fig. 1). The first enclosure was transformed into a noble residence, by equipping the castle with new elements of the Italian Renaissance, acquiring new functions. The glory era dates back to the 17th century, when for a time the princes of Transylvania resided in the city of Făgăraș and the legislative power of the country met 11 times. Between 1690[2] when Transylvania came under Austrian administration, and 1918, there was a military garrison in the fortress, the monument being subjected to modifications, in addition to strengthening the defensive capacity and modernization, mainly of the extensive sewer system.

After 1918, the fortress was successively a camp for the prisoners returning from Russia (1919–1920), a Romanian military garrison, a political prison (1950–1960), and then it acquired an economic purpose – the location of units of the craft, public food and accommodation cooperation, in parallel with museographic ones. Today, it is exclusively the Museum of the Făgăraș County, also housing the municipal library[3].

After the prison was evacuated, extensive restoration works took place in the fortress between 1963 and 1977, followed by others in 2011, 2014–2015, preceded or accompanied by archaeological research (1964–1973, 1987, 1998, 2011–2012)[4]. In 2020, a new and consistent restoration process began, planned for two years[5]. On this occasion, rescue archaeological research was carried out[6] in those areas where the soil was to be affected by the works of the builder, especially those of modernization of utilities. The faunal material that is the object of the present study comes from a feature (Feature 2 – site notations) located in the southern outer courtyard of the fortress and was researched in the summer of 2020. It consists of a three-sided construction, built of stone and some brick, attached to the south side of the castle about 2.20 m west of the southeast tower (Tomori Tower). The result was an approximately rectangular structure with inner dimensions of 2.00 m (west–east) × 1.70 m (north–south) and a depth of -2.30 m (considering the elevation +/- 0 the upper part of the feature wall when attached to the castle wall).

The walls of the feature are slightly irregular with a thickness of 70–80 cm, their foundations showing recesses at about -2.05 m. The foundation of the east side has a slightly uneven retreat of 2–5 cm starting from south to north, and that of the west side starts with a plinth at the northern end of 10 cm, after which it gradually widens to 40 cm at the opposite end. Both foundations are "woven" with the foundation of the south side and attached to the castle wall. The surface at the bottom of the feature (between -2.30–2.05 m) is irregular trapezoidal, becoming rectangular from -2.05 m upwards (Fig. 2).

The feature had two phases, indicated by a wall positioned at -0.45 m on the west side, partly over the wall, partly over the existing filling inside the pit. The southern side has also been incorporated into a much larger ensemble, which continues to the east just beyond the boundary of the feature, but especially to the south, including an impressive sewer system with brick vaults made in the Austrian era. The mentioned structure underwent some changes during the period 1950–1960, when the penitentiary was here.

The feature was completely emptied, and the filling consisting of brown earth and the inevitable remains of rubble (stone, brick and lime-yellow-sand mortar) contained numerous and various archaeological materials. In addition to the faunal remains, which are the main subject of the article, a large and varied amount of pottery was found, including whole or complete vessels, tiles, fragmented glass vessels and clay pipes. A detailed presentation of them will be made on a future occasion. We currently use their typological dating to chronologically frame the feature and implicitly the archaeozoological material. The artefacts collected date mainly to the eighteenth and nineteenth centuries, so to the Austrian era, noting that some of them have been used even earlier, during the seventeenth century. The feature, most likely with its early phase in the mid-seventeenth century, had functioned as a latrine pit, in which all sorts of debris, mentioned above, were gradually thrown.

It should be mentioned that in the southern wing of the castle, on level III, there is the "big hall" (the Diet), preceded by an antechamber, and below, on level II, the rooms where the lords or captains of the city lived, a dining room and other three spaces with names and related

[2] In 1689, an Austrian garrison had already been installed in the fortress of Făgăraș, not subordinated to the captain of the fortress, and in 1696 the fortress became the property of the Habsburg crown.

[3] Sebestyén 1992, p. 122–125.

[4] Pușcașu, Pușcașu 1973, p. 74; Cantacuzino 1997; Marcu-Istrate *et alii* 2012; Marcu-Istrate 2012.

[5] The project "Restoration and sustainable use of the Cultural Heritage of Făgăraș Municipality – Făgăraș fortress", resulted among many other works, in a bridge built over the moat on the north side, at the end of the restoration to be the access road for visitors, while on the east side a mobile bridge is being rebuilt, as it had existed since the end of the 16th century.

[6] The archaeological research was organized by the "Vasile Pârvan" Institute of Archaeology in collaboration with the Făgăraș Country Museum "Valer Literat", under the scientific responsibility of Dr. Adrian Ioniță. The team consisted of Dr. Daniela Marcu Istrate, Dr. Cătălin Constantin and Horia Pirău.

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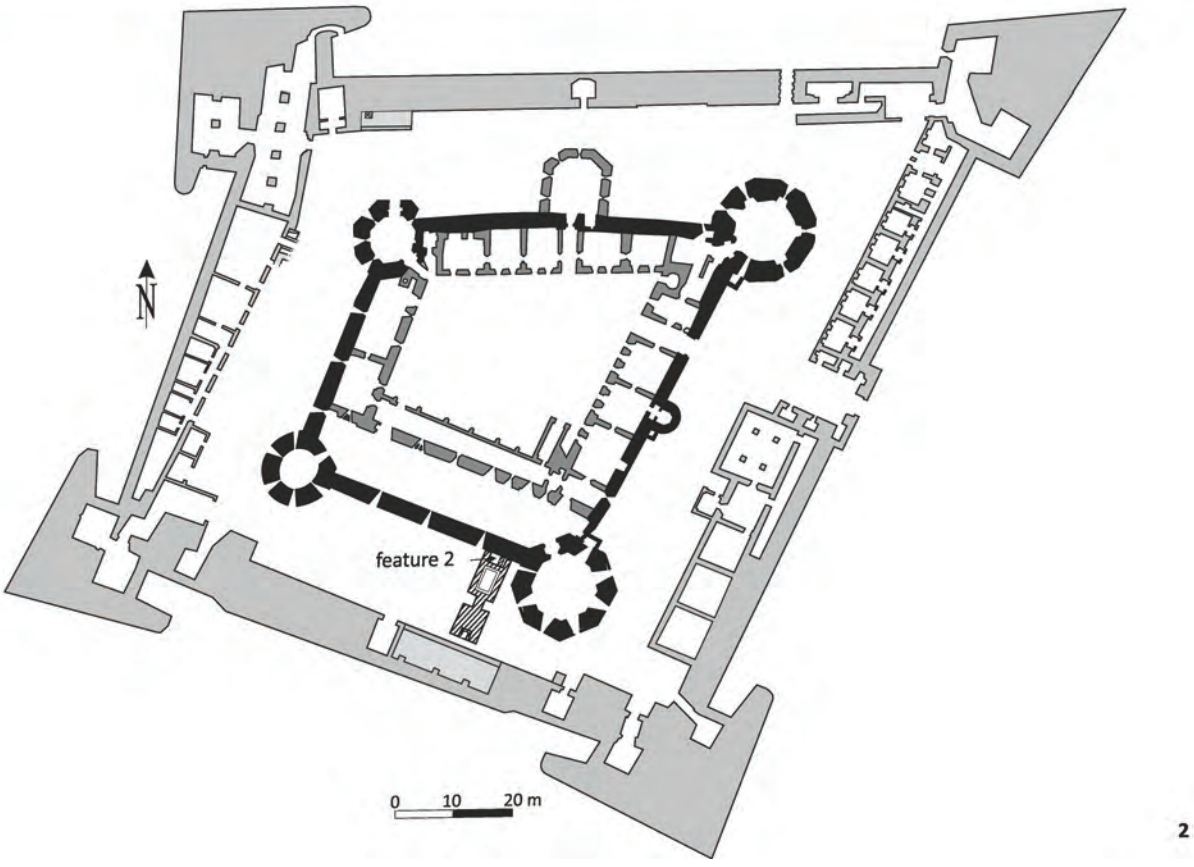

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Figure 1. *1. Făgăraş fortress – view from the southwest; 2. The plan of the Făgăraş fortress with the place of discovery.*

functions. The two levels rise above the "large / long / inner cellar", which stretches along the entire length of the south side. The feature is located at the base of the castle wall right in front of the anteroom of the large hall on level III, which overlaps the room on level II called in the inventories of the seventeenth century: "Mailat's houses", "house", "his lord's house" or "the house of the captains"[7].

[7] Sebestyén 1992, p. 19, 21, 23, 25, 130; fig. 36 – room II-14 "captains' house" and II-15 "dining room".

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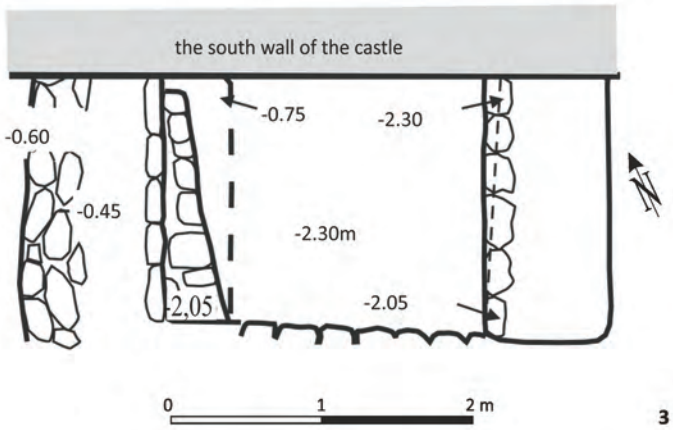

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Figure 2. *1. General view of the structure of which feature 2 is part; 2. Top view of feature 2; 3. Plan of feature 2; 4. Detail view from the east of feature 2; 5. Detail view from the south of feature 2.*

According to the inventories of 1656 and 1676, the latter was provided with a latrine[8]. When the room was given another destination, the latrine was abandoned, its door blocked and all traces of its existence erased. In other cases observed in the fortress, the gap in the latrine door was partially transformed into a window.

The importance of the feature and of the faunal sample collected here is mainly due to the fact that for the Habsburg period in Romania there are very few archaeozoological studies. At this moment we have identified a single analysis at Pricske[9] (near Gheorghieni) pertaining to the 18th century. Thus, the study regarding the Făgăraș fortress, presented below, completes and nuances our knowledge on the subject**.**

II. ARCHAEOZOOLOGICAL METHODOLOGY

In the process of the taxonomic determination of the faunal remains, especially the mammalian bones, we used the reference collection (comparative anatomy) of the Archaeozoology Laboratory within the "Vasile Pârvan" Institute of Archaeology, Romanian Academy. Schmid[10] and Silver's[11] methodological volumes were also used for their identification. For the discrimination of ovicaprid remains (*Ovis aries / Capra hircus*) the specialized bibliography was used, namely Boessneck[12] and Zeder & Lepham[13] for the differentiation based on the post-cranial skeleton. For the estimation of the slaughter ages based on dentition (eruption and dental wear) in pigs (*Sus domesticus*) and cattle (*Bos taurus*) we used Grant[14], and for ovicaprids we used Payne[15]. To correlate the skeletal / dental ages with the biological ages, we used the work of Udrescu and collaborators[16]. In the case of the taxonomic identification of bird remains, the works of Gilbert[17] and Baumel[18] were consulted.

The measurements of the faunal remains were taken with a calliper that has an instrumental accuracy of 1/10 millimetres. These were taken according to von den Driesch's[19] recommendations and are listed in the biometric data annex (Appendix 1). Despite the inaccuracy of the method of estimating the height (withers height) due to the strong allometry, especially in domestic animals, this was done using the coefficients indicated in Udrescu and collaborators[20]. The distribution of the faunal remains by species and anatomical elements is listed in Appendixes 2 and 3.

III. PRESENTATION OF THE FAUNAL MATERIAL

956 faunal remains (weighing 13474 grams) belonging to birds and mammals were studied from a taxonomic point of view. Thus, of the total number of fragments, 935 belong to mammals (97.8% as NR, 99.25% by weight), and 21 remains belong to birds (2.2% as NR, 0.75% by weight) (Table 1).

Species	**NR**	**%**	**W**	**%**	**MNI**	**%**
Bos taurus	464	73.42	10601	89.03	6	28.57
Ovis aries	4	0.63	28	0.24	2	9.52
Ovicaprid	103	16.30	543	4.56	5	23.81
Sus domesticus	57	9.02	680	5.71	6	28.57
Capreolus capreolus	1	0.16	36	0.30	1	4.76
Lepus europaeus	3	0.47	19	0.16	1	4.76
Total determined	**632**	**100.00**	**11907**	**100.00**	**21**	**100.00**
Big size mammals indetermined	212		1356			
Medium size mammals indetermined	91		111			
Total mammals	**935**		**13374**		**21**	
Gallus domesticus	9		36		3	
Anser sp.	12		64		2	
Total birds determined	**21**		**100**		**5**	
TOTAL FAUNA	**956**		**13474**		**26**	

Table 1. *Numerical and frequencies distribution of the faunal fragments as number of remains (NR), weight (W in grams) and minimum number of individuals (MNI).*

[8] Sebestyén 1992, p. 32–33; fig. 36 – room II-14. The latrines were mostly made of planks on consoles, covered with shingles and provided with a window, always placed on the outer wall opposite the inner courtyard.
[9] Tugya 2016.
[10] Schmid 1972.
[11] Silver 1969.
[12] Boessneck 1969.
[13] Zeder, Lepham 2010.
[14] Grant 1982.
[15] Payne 1973; 1985.
[16] Udrescu *et alii* 1999, p. 68–70.
[17] Gilbert *et alii* 1981.
[18] Baumel 1979.
[19] von den Driesch 1976.
[20] Udrescu *et alii* 1999, p. 97.

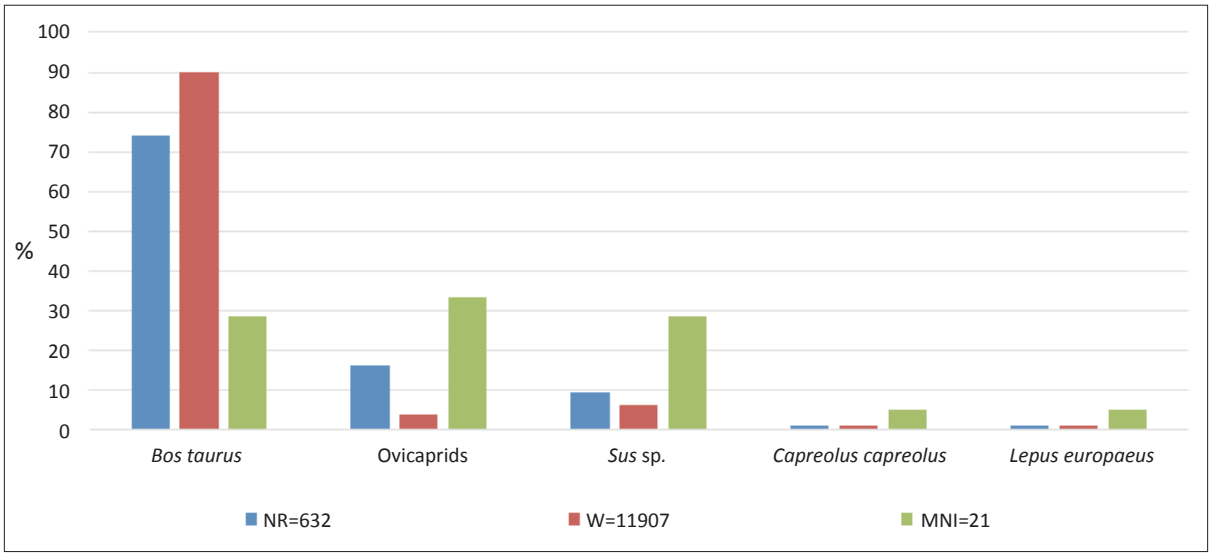

Figure 3. *Frequency distribution of the mammal remains as number of remains (NR), weight (in grams) and minimum number of individuals (MNI).*

The birds are only domestics (goose and chicken). As number of remains (NR), goose is present with 12 remains and chicken with nine. As minimum number of individuals (MNI) five individuals were identified: three geese (*Anser* sp.) and two chickens (*Gallus domesticus*). Most bird fragments come from meat-rich areas. Thus, chickens were represented by four humeri, three femurs and two tibiotarsi. From goose there is a sternum fragment, three humeri, two radio ulnae, two sinsacrum fragments and two tibiotarsi. The goose yielded the remains of a skull and a tarsometatarsus that come from poor meat areas. Most of the bones belong to mature individuals, and only two remains from a juvenile goose.

935 mammal remains were identified in the faunal material. Of these, 632 remains were taxonomically determined, which represents 67.59% in number of remains and 89.03% in weight. The list of identified species is not very rich and it includes the domestic triad consisting of cattle (*Bos taurus*), ovicaprids (*Ovis aries / Capra hircus*) and pigs (*Sus domesticus*). Game consists of hare (*Lepus europaeus*) and roe deer (*Capreolus capreolus*) (Table 1 and Appendix 4).

In the domestic assemblage cattle predominate in the faunal spectrum with approximately 464 remains (73.42%), followed by ovicaprids with 107 remains (16.93%) and pigs with approximately 57 remains (9.02%) (Table 1). The game is present in an extremely small amount, with only one roe deer (0.16%) and three hare remains (0.47%).

In terms of weight, cattle are significantly better represented than the other species, with approximately 89.03% of the total weight of the analysed remains, followed by pig (5.71%) and ovicaprids (4.80%) (Table 1). In the wild spectrum we have the roe deer (0.3%) and hare (0.16%).

The MNI was quite easy to calculate considering the number of remains analysed. Thus, for cattle (Appendix 4, photos 1–4), at least six individuals were identified based on six proximal epiphyseal right radii (over 1.5 years[21]). In four cases we could determine the age more precisely based on the dental eruption and dental wear: a 1–2 years old juvenile, a 2–2.5 years old subadult, an 8 years old mature adult and a 12–14 years old adult.

At ovicaprids, (Appendix 4, photos 5–8) on the basis of seven femurs – three proximal right fused epiphyses (over 3.5 years[22]) and four distal left unfused epiphyses (under 3.5 years[23]) – at least seven individuals were identified, of which four could indicate the age more precisely based on tooth eruption and wear: a juvenile of 6–9 months, a subadult of 21–24 months, an adult of 3–4 years and an adult of 6–8 years. At least two individuals are sheep, identified based on the morphology of two calcanei, and at least one is a female, based on the polled neurocranium (Appendix 4, photo 5). Polled sheep were not identified during the Romanian Middle Ages[24], which is why such a discovery is extremely interesting. It is difficult to say whether such a sheep comes from the local stock or was an import.

Pig (Appendix 4, photos 9–12) is present with six individuals, four of which were determined based on tooth eruption and wear: three subadults, one 18–24 months old, one 22–24 months old and another 22–30 months, to which we can add an adult of 36–60 months. Two other individuals were determined based on the degree of epiphyseal fusion of the scapula, one infant being less than one year old[25] (unfused scapular head), and one about one year old (the scapula is in the course of epiphysation) that does not fall into the age categories above. Thus, based on

[21] Schmid 1972, p. 75.
[22] Schmid 1972, p. 75.
[23] Schmid 1972, p. 75.
[24] Bejenaru 2003, p. 124; Bejenaru 2006, p. 121.
[25] Schmid 1972, p. 75.

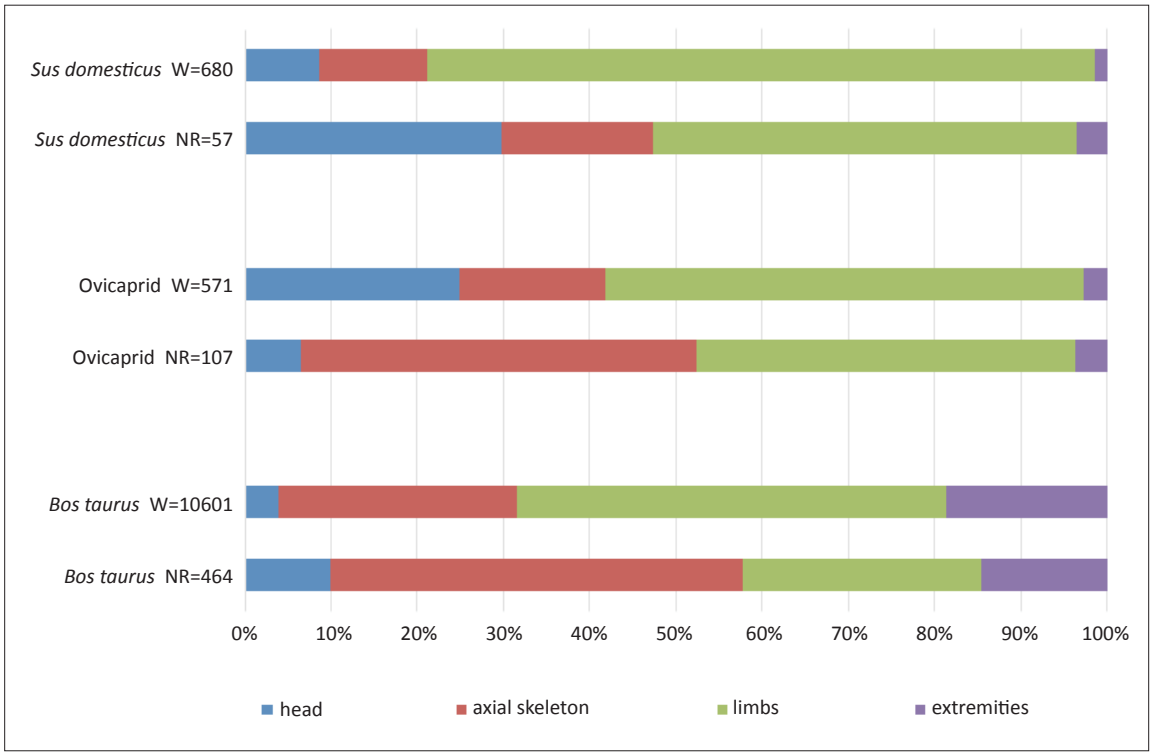

Figure 4. *Frequency distribution (as NR and W), by body parts of the main domestic species studied.*

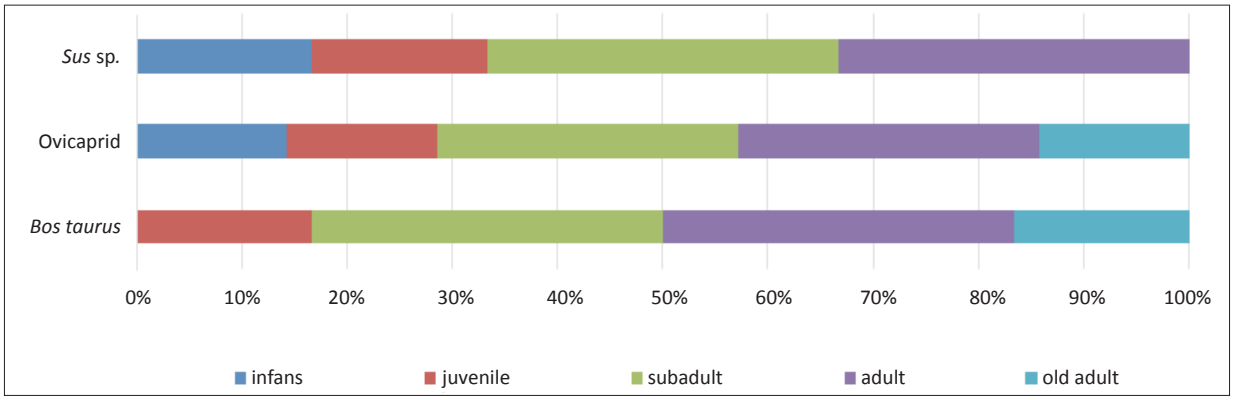

Figure 5. *Frequency distribution by biological age classes for domestic species.*

the age of slaughter, we observe the existence of greater number of animals that had reached body maturity (over 18 months) and that had significant weight, which means that at the slaughter age they probably obtained an optimal yield of meat, fat etc.

Thus, if NR- and W-wise cattle definitely predominate, MNI-wise, ovicaprids slightly exceed cattle and pig (Fig. 3). However, given the more important body weight of cattle and the fact that an adult domestic bovid is the equivalent to at least six ovicaprid individuals or three pigs[26], we can emphasize the greater importance cattle had in the diet of the community from Făgăraș fortress.

The game yields very low weight, with only two wild species identified: roe deer (*Capreolus capreolus*), represented by an epiphyseal tibia (Appendix 4, photo 13) from a subadult / adult individual, and hare (*Lepus europaeus*), represented by a scapula, a tibia and a femur (Appendix 4, photo 14) originating from one adult individual.

We note the distribution of the anatomical elements of the main domestic species discovered at the Făgăraș fortress (Appendixes 2–3 and Fig. 4). We grouped the different anatomical elements into categories of body parts: head (remains of the neurocranium, viscerocranium, teeth, and hyoid bone), axial skeleton (vertebrae and ribs), limbs (scapula, coxal, humerus, femur, radius, ulna, tibia and fibula) and extremities (carpal, tarsal, metapodials, sesamoids and phalanges).

Thus, for the entire domestic triad (cattle, ovicaprids and pigs), it was observed that the limbs together with

[26] Udrescu *et alii* 1999.

the axial skeleton, which are the parts richest in meat, are predominant compared to the head and extremities which do not fall into the category of body parts rich in meat and which are quite poorly represented in the sample. These differences are extremely visible especially when comparing the weight of the faunal remains, indicating that weight is a much more objective parameter compared to the number of remains.

The study of slaughter ages and the distribution of anatomical elements / skeletal parts in the case of domestic animals suggests the consumption of subadult and adult animals (Fig. 5) that had less tender meat, some of the animals being even at the age of reform (especially the old ones) suggesting that they were part of the daily food of the fortress staff (soldiers, civilians and administration, etc.).

IV. TAPHONOMY

A first argument to support the fact that this household waste is the result of the food consumption of species found in the faunal spectrum is both the increased fragmentation of the bones and the presence of the anthropogenic marks. Thus, numerous coarse cuts caused by a heavy tool such as an axe / cleaver used for the disarticulation and cutting of the animals were observed, but there were also fine cuts made by a knife-type tool indicating the defleshing of the meat-rich bones. Traces of burning are extremely few, we identified only two fragments (0.2% of the total fauna). The lack of these traces of burning directly on the bones could suggest that the slices / pieces of meat were either very well deboned before cooking, or boiling was predominantly used.

IV.1. Birds

Anthropogenic traces of cutting were observed only on the goose (*Anser* sp.) bones: on the humerus (at the proximal end, five traces of a knife, and at the distal end, four traces of a knife as well as some traces of rodent teeth), the radius (a knife mark) and the sinsacrum (two knife marks on the inside).

IV.2. Cattle (*Bos taurus*)

At the head we noticed cuts on the surface of the mandibular body on the outer area of the diastema (Fig. 6). At the hyoid bone, a series of cuts suggested the removal of the tongue. Most vertebrae were cut longitudinally with blows on the vertebral body of an axe-type tool; some vertebra show fine knife marks also suggesting disarticulation. Most ribs were display cutting marks produced by a heavy tool, some being sliced to sizes ranging mostly between 8 and 12 cm, and there are also a few knife marks. A single rib shows traces of burning.

In the area of the wide bones (scapula and coxal) one can distinguish the cuts made with an axe / cleaver, but also some traces of a knife. At the scapula there were transversal cuts in the middle of it, as well as oblique cuts nearby the neck. Knife cuts are also present on the scapular spine and on the supraspinous fossa. At the coxal we noticed traces of disarticulation above the acetabulum, at the ilium, and at two coxal bones on the right side, there were traces of cutting in the area of the pubis.

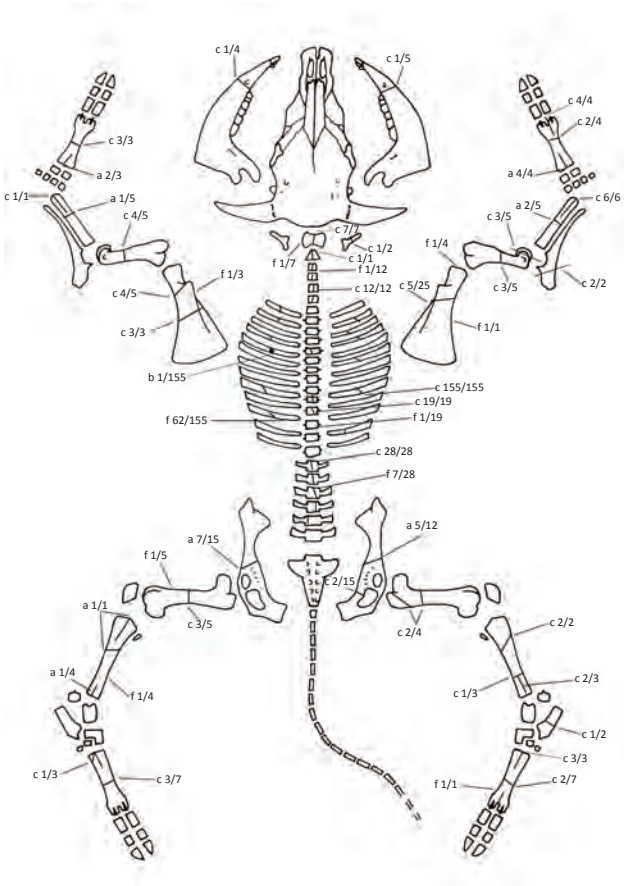

Figure 6. *Anthropic traces related to food activity observed on cattle bones (Bos taurus) (a – disarticulation, f – (de)fleshing, b – burning, c – cutting). Figures indicate the ratio between anatomic elements with taphonomic changes and the total number identified. Descriptive sheet of the species after Helmer*[27].

On most surfaces of the long bones (humerus, radio-ulna, femur and tibia) there are traces left by a heavy axe-type tool, these being cut first transversely and then longitudinally during the disarticulation / cutting process (Fig. 6). The humerus was mostly cut transversely at the diaphysis, only one being cut both transversely and longitudinally. On the distal area we noticed that the condyles were cut longitudinally. The radii were cut both transversely and longitudinally at the diaphysis. Some ulnae were cut proximal to the base of the olecranon. Most femurs were cut at the diaphysis, but some have axe marks both at the large trochanter and knife marks at the small trochanter. On a tibial shaft we noted two cuts from two different tools, an axe / cleaver and a saw. These traces can

[27] Helmer 1987.

be seen from two different planes: the axe mark is from the medial plane, and the saw mark from the lateral plane. This is the only piece of bone in the study that shows such a saw mark.

At the autopodium we will discuss only the posterior basipodium (calcaneus) and metapodials (metacarpus and metatarsus). Thus, for the calcaneus, a transverse cut was observed on the body. Also, on the surface of the metapodials there are axe marks that are both longitudinal on the proximal third and transverse on the distal third. Only a metatarsal showed one trace of a knife blade on the distal part.

IV.3. Ovicaprids (*Ovis aries*/*Capra hircus*)

On the mandible there were oblique-transversal cuts between the mandibular angle and the coronoid process, possible for the separation of the mandible from the skull (Fig. 7). Of the 44 ribs studied, 14 were cut with a heavy tool, and five had knife marks on the inner face suggesting the evisceration of the animals.

On the scapula, there are traces of both disarticulation and defleshing. Traces of skinning can be seen in the supraglenoid tuberosity, at the base of the scapular spine and on the supraspinous fossa. The traces of disarticulation were left by an axe-type tool and are located at the neck and obliquely on the subspinous spine. On the long bones, cuts were left by an axe / cleaver on the humerus, femur and tibia shafts. Also, a femur and a tibia show traces of skinning on the proximal part, and a radius of an infant has three traces on the diaphysis.

On one side of the calcaneus, a single knife cut was observed.

IV.4. Pig (*Sus domesticus*)

On the mandible, one burning mark was noted on a male canine (Appendix 4, photo 9) which may suggest scorching the pig hair, probably in order to consume the skin. On the vertebrae, a thoracic vertebra was cut both

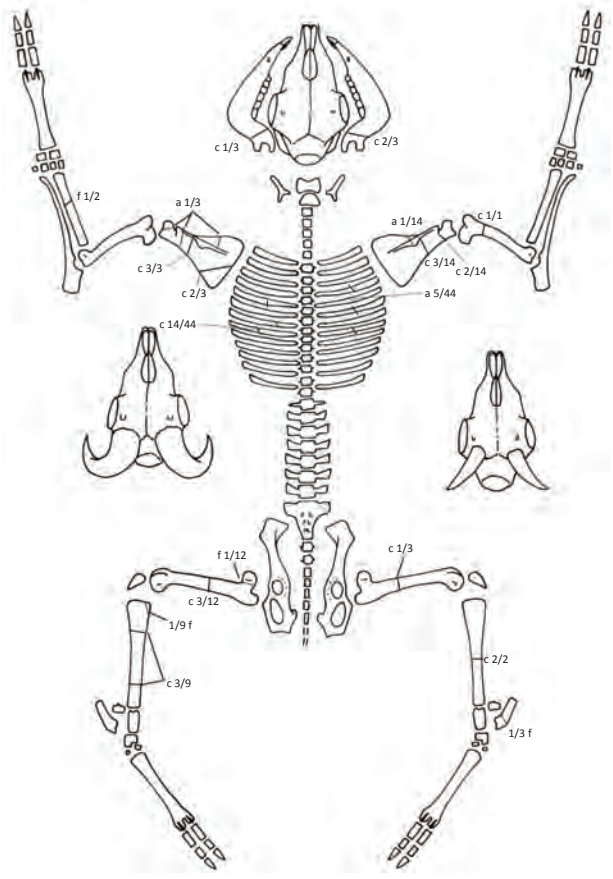

Figure 7. *Anthropic traces related to food activity observed on the bones of ovicaprids (Ovis aries / Capra hircus) (a – disarticulation, f – (de)fleshing, c – cutting). Figures indicate the ratio between anatomic elements with taphonomic changes and the total number identified. Descriptive sheet of the species after Helmer[28].*

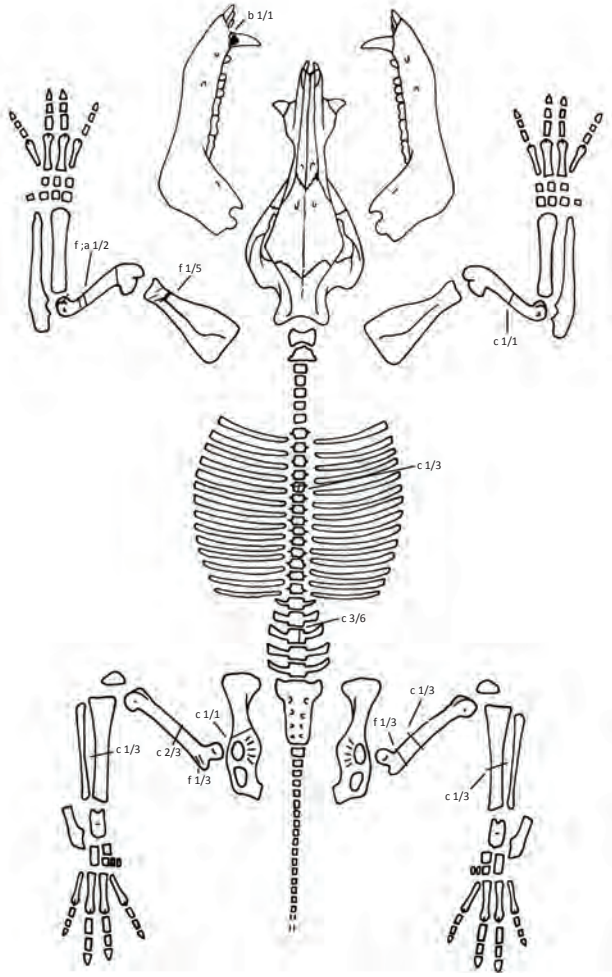

Figure 8. *Anthropic traces related to food activity observed on pig bones (Sus domesticus) discovered at the Făgăraș fortress (a – disarticulation, f – (de)fleshing, b – burning, c – cutting). Figures indicate the ratio between anatomic elements with taphonomic changes and the total number identified. Descriptive sheet of the species after Helmer[29].*

[28] Helmer 1987.

[29] Helmer 1987.

transversely and longitudinally, and three lumbar vertebrae were cut longitudinally. On the scapula there were approximately ten traces of a knife on the supraglenoidal tuberosity, near the glenoid angle and on the scapular spine, while on the coxal bone there were two cuts made by a heavy tool on the ilium.

On the long bones (humerus, femur and tibia) there are numerous traces of coarse and fine cuts at the diaphyses and epiphyses (Fig. 8). What caught our attention in particular is the case of a humerus and a femur (both of subadults), almost complete, that show a series of parallel fine (knife) cuts that could suggest the production of probably smoked meat ham.

IV. 5. The cutting techniques used at the Făgăraș fortress

This small taphonomic study gives us an insight into the butchery techniques identified on this faunal sample from the Făgăraș fortress. The vast majority of the household waste comes from domestic animals that were slaughtered for culinary purposes and probably consumed in the Făgăraș fortress. We cannot accurately visualize the technique by which these animals were killed, but thanks to the taphonomic study we were able to show some of their butchering techniques.

As we have shown above, the animals went through a series of stages: primary cutting, evisceration, secondary cutting (disarticulation and skinning). The primary cutting consists of separating the head and the limbs from the trunk. It is characterized by a series of traces that can be identified in the occipito-cervical region, shoulder blades, coxal bones and sacrum. We noticed traces of beheading only at cattle: rough cutting with an axe / cleaver type of the atlas and the axis. The cutting of the spine is suggested by the traces left only for the domestic triad. Longitudinal splitting of the vertebrae on the vertebral body seems to have been widely practiced for all species (Fig. 6–8).

The evisceration of the animal, which aims to extract the viscera from the cephalic region (tongue and brain), thoracic (lungs and heart) and abdominal (liver, spleen, stomach, intestines, etc.) rarely leaves traces, but the presence on most ribs of knife marks on the inner face may indicate the removal of the lungs and heart from the rib cage. We must also mention the extraction of the tongue at one cattle individual based on the traces left on the hyoid (Appendix 4, photo 2).

Secondary cutting allows obtaining pieces of meat for cooking. This is done by disarticulation and dismemberment (deboning). This type of trace current at this faunal sample. The traces of disarticulation are deeper and shorter than those resulting of primary cutting and are distributed on the ligaments or joints (humeral condyles, acetabulum and glenoid cavity) and on the epiphyses (Fig. 6–8).

The portioning and fragmentation of the bones is related to secondary cutting and occurred on a daily basis. Depending on the type and area of the bone, the latter was sectioned into several parts. In the case of the long bones, they were also split transversely to extract the bone marrow.

We also considered the culinary habits at the Făgăraș citadel. Although there are a multitude of recipes for princely meals, apparently the translator of the princely cookbook (Princess Anna Bornemisza's Cookbook from 1680[30]) did not pay enough attention to the meals of the lower-ranking inhabitants (fortress staff – soldiers, civilians, administration, etc.), but focused only on the meals of emperors, kings and princes[31] and therefore we cannot draw any parallels between the written sources and the archaeozoological study conducted in this article.

V. BIOMETRY

The faunal material, although not very numerous, still allowed the biometric analysis of about 10% of the analyzed fauna (Appendix 1). Unfortunately, very few whole bones could be measured, and these fell mostly in the category of the short bones (talus, calcaneus, phalanx, etc.). The most numerous measurements were taken mainly on the epiphyses of the long bones. Despite a relatively small sample from a biometric point of view, we chose to publish this biometric data in full, given the scarcity of such information that ultimately allows us to characterize the animal populations of the past.

Biometric comparisons are possible only with the Pricske[32] fauna, relatively contemporary with that of Făgăraș. Thus, apparently the cattle from Făgăraș seem to be more massive based on scapula size, but more fragile based on humerus, radius and tibia measurements. These variations may be due both to the size of the studied samples which are relatively small, but also to the rather pronounced sexual dimorphism in this species.

The sheep from Făgăraș are slightly larger than those from Pricske. The existence of two calcanei and a whole talus allowed us to estimate the height of this species (Teichert index[33]) which has an average of 65.7 cm (N = 3, limits 62.9–68.7 cm). The height value falls in the upper half of the interval of average values for the medieval settlements in Wallachia and Banat, but rank lower than those in Moldavia and Crișana[34].

Pigs from Făgăraș and Pricske are biometrically relatively similar.

VI. DISCUSSIONS

The importance of the sample from the Făgăraș fortress is also given by the fact that such archaeozoological

[30] Lakó 1983.
[31] Grapă 2019, p. 87.
[32] Tugya 2016
[33] Udrescu *et alii* 1999, p. 97.
[34] Bejenaru 2006, p. 121–122, tabel 4.7.

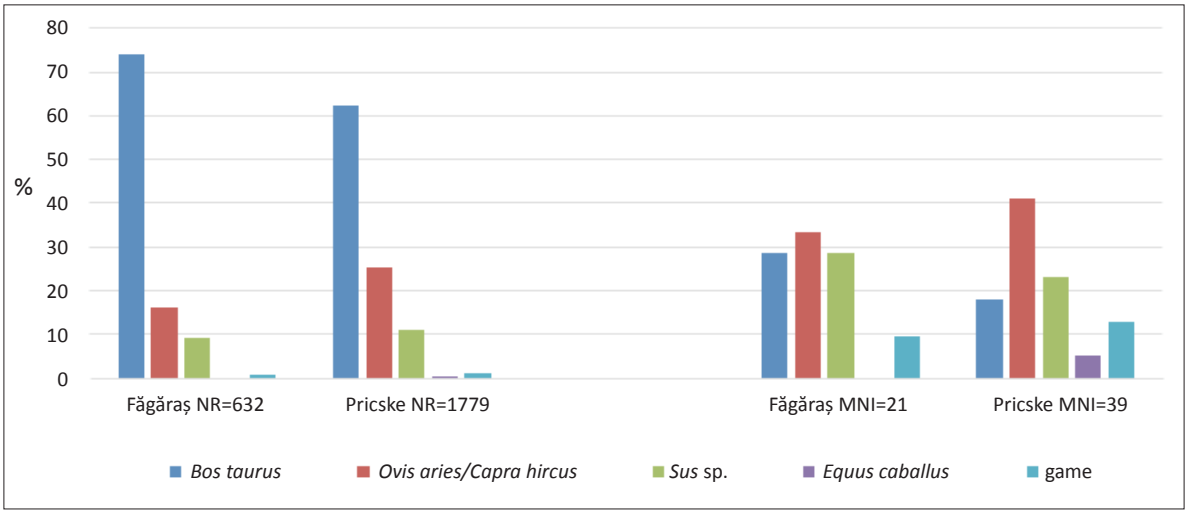

Figure 9. *Comparison between the site from Făgăraș fortress and the one from Prickse based on the number of remains (NR) and the minimum number of individuals (MNI).*

studies, for the Habsburg period, are extremely rare in Romania. Literature holds only the analysis of the Pricske quarantine[35] (near Gheorghieni) dated to the 18th century. The archaeozoological sample from Pricske that gathers only taxonomically determined mammal remains is almost three times larger (NR = 1779) than the one from Făgăraș (NR = 632) (Fig. 9).

When comparing Făgăraș fortress with Pricske, we notice that in terms of the number of remains, cattle predominate at both sites, followed by ovicaprids and then pigs (Fig. 9). At Pricske horse was also present, but not in Făgăraș. At both sites game has an extremely low weight, with red deer, roe deer and hare identified at Pricske, unlike Făgăraș where only the last two species were present.

MNI-wise, things are getting more nuanced. If at the Făgăraș fortress there was a relative equality between the three species of domestic animals, at Pricske ovicaprids were seconded by pigs and then by cattle (Fig. 9), but given the higher weight of cattle we may conclude that they are of the greatest importance in the exploitation of domestic animals, also observed in Făgăraș.

VII. CONCLUSIONS

The analysed material comes from a single archaeological feature, so the conclusions are quite limited. The data cannot be generalized, but they show a trend that was probably not far from reality. We make this clarification because during the older or newer archaeological research, in various areas of the Făgăraș fortress, numerous animal bones were discovered, with or without a clear dating context, which could not be collected or analysed.

The fauna studied in this article suggests the diet of the human community that served the Făgăraș fortress in general in the Habsburg period. Cattle have an overwhelming weight NR-wise, and they predominate the faunal spectrum. MNI-wise, although cattle are in the second place, after ovicaprids, they still hold the highest importance in terms of meat weight, compared to other domestic animals. The game has an extremely low importance, with only medium-sized species (roe deer) and a small species (hare) identified.

The study of the slaughter ages and the distribution of anatomical elements / skeletal parts in the case of the domestic animals suggest the consumption of subadult and adult animals that had less tender meat, some of the animals being even at the age of reform (especially the old ones) which would suggest that they were part of the daily food of the fortress staff (soldiers, civilians, administration, etc.).

Future archaeozoological research will certainly help us understand better the diet of the population in the Habsburg era.

[35] Tugya 2016.

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REFERENCES

Baumel 1979 – J. Baumel, *Nomina anatomica avium. An annotated anatomical dictionary of birds*, London – New York – Toronto – Sydney – San Francisco, 1979.

Bejenaru 2003 – L. Bejenaru, *Arheozoologia spațiului românesc medieval*, Iași, 2003.

Bejenaru 2006 – L. Bejenaru, *Arheozoologia Moldovei Medievale*, Iași, 2006.

Boessneck 1969 – J. Boessneck, *Osteological differences between sheep (*Ovis aries Linne*) and goat (*Capra hircus Linne*)*, in: D. Brothwell, E. Higgs (eds.), *Science in Archaeology*, London, 1969, p. 332–358.

Cantacuzino 1997 – Gh. I. Cantacuzino, *Cercetări arheologice la Făgăraș*, CA 10, 1997, p. 239–255.

von den Driesch 1976 – A. von den Driesch*, A guide to the measurement of animal bones from archaeological sites*, Peabody Museum Bulletin 1, 1976.

Gilbert *et alii* 1981 – B. M. Gilbert, L. Martin, H. Savage*, Avian Osteo-Archeology*, Wyoming, 1981.

Grant 1982 – A. Grant, *The use of tooth wear as a guide to the age of domestic ungulates*, in: B. Wilson, C. Grigson, S. Payne (eds.), *Ageing and Sexing Animals from Archaeological sites*, BARBrSer 109, Oxford, 1982, p. 91–108.

Grapă 2019 – J. Grapă, *O capodoperă a artei culinare princiare în cetatea de la Făgăraș*, ActaTF 8, 2019, p. 82–96.

Helmer 1987 – D. Helmer, *Fiches descriptives pour les relevés d'ensembles osseux animaux,* Fiches d'ostéologie animale pour l'archéologie, Serie B- mammifères, Sophia-Antipolis, CNRS, 1987.

Lakó 1983 – E. Lakó, *Bornemisza Anna szakácskönyve 1680-ból*, Bucureşti, 1983.

Lukács 1999 – A. Lukács, *Ţara Făgăraşului în Evul Mediu (secolele XIII–XVI)*, Bucureşti, 1999.

Marcu-Istrate 2012 – D. Marcu-Istrate, *Cetatea Făgăraș (I)*, Interferențe 2, 2012, p. 11–13.

Marcu-Istrate *et alii* 2012 – D. Marcu-Istrate, G. Izdrăilă, I. Șchiopu, *Făgăraș, jud. Brașov. Punct: Cetate (115)*, CCA, campania 2011, Târgu Mureș, 2012, p. 211–213.

Payne 1973 – S. Payne, *Kill-off patterns in sheep and goats: the mandibles from Asvan Kale*, AnSt 23, 1973, p. 281–303.

Payne 1985 – S. Payne, *Morphological distinctions between the mandibular teeth of young sheep (*Ovis*), and goats (*Capra*)*, JAS 12, 1985, p. 139–147.

Pușcașu, Pușcașu 1973 – V. M. Pușcașu, N. Pușcașu, *Cetatea Făgăraș – orașul Făgăraș – jud. Brașov*, in: *Săpăturile arheologice efectuate de D.M.I.A. în anul 1972*, BMI 42(1), 1973, p. 74–75.

Schmid 1972 – E. Schmid, *Atlas of Animal Bones*, Amsterdam-London-New York, 1972.

Silver 1969 – I.A. Silver, *The Ageing of domestic animals*, in: D. Brothwell, E. Higgs (eds.), *Science in Archaeology*, London, 1969, p. 283–302.

Sebestyén 1992 – Gh. Sebestyén, *Cetatea Făgăraşului*, Bucureşti, 1992.

Tugya 2016 – B. Tugya, *Állatcsontleletek a pricskei veszteglőhely területéről / Oase de animale descoperite la caratina de la Prickse*, in: A. Demjén (ed.), *Gyergyószentmiklós a régészeti kutatások türkrében / Gheorghieni în lumina cercetărilor arheologice*, Cluj-Napoca, 2016, p. 195–215.

Udrescu *et alii* 1999 – M. Udrescu, L. Bejenaru, C. Hrișcu, *Introducere în arheozoologie*, 1999, Iași.

Urkundenbuch I – F. Zimmermann, C. Werner (eds.), *Urkundenbuch zur Geschichte der Deutschen in Siebenbürgen I*, Hermannstadt, 1892.

Zeder, Lepham 2010 – M. Zeder, H. Lapham, *Assessing the reliability of criteria used to identify postcranial bones in sheep,* Ovis*, and goats,* Capra, JAS 37, 2010, p. 2887–2905.

Appendix 1. Biometrics – measurements are given in millimetres and their codes follow von den Driesch[36].

Gallus domesticus

HUMERUS

GL	64.78	77.35	70.78	
BD	13.33	15.56	15.04	
SC	6.27	6.97	7.01	8.66
Bp	17.44	21.39	14.54	22.73

TIBIOTARSUS

GL	96.56	
LM	95.54	
DiP	16.69	20.58
Dd	9.97	

FEMUR

GL	68.67	69.6	86.12
LM	63.91	66.5	83.26
BP	13.4	13.14	16.38
DP	9.8	10.28	11.8
BD	13.6	12.2	15.84
Dd	11.11	11.33	9.62

Anser anser

HUMERUS		
Bp	32.23	
Bd		22.76

RADIO-ULNA		
Bp	15.07	
DiP	17.82	
DiD		14.63

TIBIOTARSUS

GL	143.83	
Dd	17.09	
LM	139.64	
DiP	18.02	21.2

TARSOMETATARSUS

GL	77.03
BP	16.94
BD	19.09
SC	7.66

Bos taurus

MANDIBLE

L M3	36.01
B M3	15.01

MAXILLARY

L M3	29.61
B M3	19.28

SCAPULA

GLP	66.98	72.72	73.42	65.18
LG	59.22	57.93	61.19	57.99
BG	54.88	47.95	50.56	51.42

HUMERUS

BT	63.37

[36] von den Driesch 1976.

METACARPUS

Bp	61.18	62.97		
Bd			62.45	63.13

PATTELA

GL	69.96
GB	57.19

TIBIA

Bd	56.17	
Dd	40.89	48.56

METATARSUS

Bp	42.25		
Bd		61.77	58.79

PHALANX 1

GL	61.66	63.83	59.18	53.95
Bp	27.79	30.48	30.69	26.52
SD	23.21	25.68	25.39	23.77
Bd	27.77	27.3	30.38	26.58

PHALANX 2

GL	39.62	48.46
Bp	34.34	32.85
SD	25.31	25.48
Bd	26.17	26.79

PHALANX 3

DLS	72.17	60.55	81.91	71.03
Ld	52.27	46.28	63.53	52.14
MBS	21.53	20.76	26.36	22.07

CENTROTARSUS

GB	61.99

Ovis aries

CALCANEUS

GL	55.26	57.4
GB	17.87	18.16
Talia	629.96	654.36

ASTRAGALUS

GLL	30.32
Talia	687.66

Sus domesticus

MANDIBLE

L M2	14.73
B M2	20.04
L M3	33.5
B M3	15.73

SCAPULA

DHA	150.74	
SLC	19.25	
GLP	30.27	30.25
BG	21.69	

HUMERUS

SD	15.44	
Bd	38.12	37.2

PELVIS

LA	33.56
Lfo	19.38

Capreolus capreolus

TIBIA

Bd	27.54
Dd	21.14

Lepus europaeus

PELVIS

GL	95.97
LA	14.39
SH	11.04
Lfo	19.62

TIBIA

Bp	21.21
DP	23.04

FEMUR

GL	136.82
GLC	130.77
BP	26.66
BTr	24.91
DC	10.68
SD	9.93
BD	21.47

Appendix 2. Numerical distribution of faunal remains by species and anatomical elements discovered at Făgăraș fortress.

ANATOMICAL ELEMENT	*Bos taurus*	*Ovis aries*	Ovicaprid	*Sus domesticus*	*Capreolus capreolus*	*Lepus europaeus*	*Gallus domesticus*	*Anser* sp.
Cranium								1
Neurocranium	22	1		3				
Viscerocranium	3			1				
Dentes sup.				6				
Mandibula	9		6	7				
Dentes inf.	10							
Hyoid	2							
Atlas	7							
Epistropheus	1							
et Vert. cv.	12		1	1				
Vert. thor.	28		2	3				
Vert. lumb.	19		2	6				
Costae	155		44					
Sternum								1
Synsacrum								2
Scapula	43		16	6				
Humerus	11		1	3			4	3
Radius	14		1	3				
Ulna	4							
Radio–Ulna	1							2
Carpalia	7							
Metacarpus	15							
Pelvis	12		2	1		1		
Femur	11		15	10		1	3	
Patella	2		1					
Tibia	30		11	3	1	1		
Tarsometatarsus								1
Tibiotarsus							2	2
Fibula				2				
Talus	4	1						
Calcaneus	3	2	1	2				
et Tarsalia	1							
Metatarsus	15							
Phalanx 1	9							
Phalanx 2	4							
Phalanx 3	10							
TOTAL	**464**	**4**	**103**	**57**	**1**	**3**	**9**	**12**

Appendix 3. Distribution of the weight (in grams) of the faunal remains by species and anatomical elements discovered at Făgăraș fortress..

ANATOMICAL ELEMENT	*Bos taurus*	*Ovis aries*	Ovicaprid	*Sus domesticus*	*Capreolus capreolus*	*Lepus europaeus*	*Gallus domesticus*	*Anser* sp.
Cranium								7
Neurocranium**	346	12		46				
Viscerocranium	47			7				
Dentes sup.				6				
Mandibula	7		130					
Dentes inf.	10							
Hyoid	9							
Atlas	180							
Epistropheus	16							
et Vert. cv.	215		9	7				
Vert. thor.	303		16	21				
Vert. lumb.	385		15	57				
Costae	1825		57					9
Sternum								9
Synsacrum								9
Scapula	1011		74	70				
Humerus	798		9	124			20	17
Radius	958		8					
Ulna	4							
Radio–Ulna	100							7
Carpalia	73							
Metacarpus	641							
Pelvis	439		19	34	5	5		9
Femur	613		88	240	10	10	11	
Patella	52		2					
Tibia	1296		116	58	21	4		
Tarsometatarsus								15
Tibiotarsus							5	
Fibula				2				
Talus	67	4						
Calcaneus	120	12		8				
et Tarsalia	48							
Metatarsus	695							
Phalanx 1	148							
Phalanx 2	46							
Phalanx 3	149							
TOTAL	**10601**	**28**	**543**	**680**	**36**	**19**	**36**	**82**

Appendix 4. (Scale in centimetres).

Photo 1. *Cattle (Bos taurus), right jaw with axe marks.*

Photo 2. *Cattle (Bos taurus), hyoid with a cutting mark.*

Photo 3. *Cattle (Bos taurus), ribs cut with an axe.*

Photo 4. *Cattle (Bos taurus), metatarsal with transversely and longitudinally cuts.*

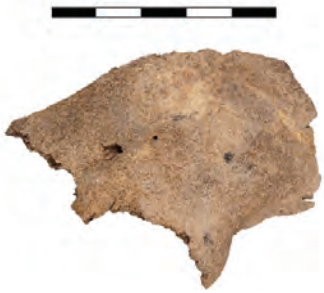

Photo 5. *Sheep (Ovis aries), horned female neurocranium.*

Photo 6. *Ovicaprid (Ovis aries/Capra hircus), right mandible with traces of cutting on the vertical branch.*

Photo 7. *Ovicaprid (Ovis aries/Capra hircus), unfused right radius.*

Photo 8. *Ovicaprid (Ovis aries/Capra hircus), right radius detail with traces of skinning on the diaphysis.*

Photo 9. *Pig (*Sus domesticus*), left male canine with traces of burning.*

Photo 10. *Pig (*Sus domesticus*), right mandible with traces of breakage to recover the bone marrow.*

Photo 11. *Pig (*Sus domesticus*), left scapula.*

Photo 12. *Pig (*Sus domesticus*), detail of the left scapula with traces of a knife in the area towards the spine.*

Photo 13. *Roe deer (*Capreouls capreolus*), left distal tibia cut transversely at the diaphysis.*

Photo 14. *Hare (*Lepus europaeus*), left femur.*