

# Traditional leather processing using domestic methods in Estonia

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## Abstract

*This article provides an overview of the traditional domestic leather processing methods used in Estonia throughout history, as well as of the research papers on leather processing that have been published or have yet to be published in Estonian. There is also an overview of the main leather processing and tanning methods (vegetable tanning, alum tawing and flour tanning). Based on her own experience, the author gives a detailed description of traditional leather processing with a fermented flour mixture (flour tanning) as one of the oldest and most widespread methods of processing hides with fur. The article also gives an overview of the current situation of traditional leather processing using domestic methods in Estonia.*

**Keywords:** animal hide, tanning, leather dressing methods

## Introduction

Animal skins have probably provided people with raw material since the beginning of humankind, since the times when people lived through hunting and gathering, and animal hides not suitable for eating were used for clothing or houses.

Items made of raw or poorly processed hides or skins usually dry rock hard; therefore, processed leather or fur is much more valuable and usable. Primitive hide processing probably consisted only of kneading and treading the raw hides. Somewhat later appeared greasing and smoking of the hides. The next step was processing animal hides with soils rich in various salts and aluminum, thus allowing the hide to retain moisture; a hide processed this way did not rot and was a flexible and durable material (Kangro 1939: 5–6). According to the properties of the skins or hides and their intended uses, but also depending on the skills and possibilities of the makers, they were processed using smoke, grease, milk products, alum, etc. Primitive tanning processes were time-consuming and may have lasted a week or even several years (Rajando 2008: 3–5).

The domestic tradition of leather processing was transferred to the next generation by oral and manual tradition. Usually men processed skins and hides, but there is also some data about women doing this work. Until the end of the 19th century and even later, leather processing in Estonian villages was predominantly domestic work (ERM KV 237:121; Viires, Vunder 1998: 187). However, there were also some village tanners to whom people could take their raw hides for processing (ERM KV 237:79; Viires, Vunder 1998: 171). There is some information about tanners of Russian origin who came to the villages in autumn and left in spring (ERM KV 237:157; Viires, Vunder 1998: 172). The customer was to give the tanner one *toop* [1.1–1.3 liters] of rye flour and one handful of salt for every skin or hide tanned. When village tanners and tanneries started to emerge, domestic leather processing was in gradual decline (Viires, Vunder 1998: 188), and at that time, knowledge and skills were passed on mainly from one craftsman to another.

During the 20th and 21st centuries, several surveys have been published on Estonian traditional domestic leather processing (Aamisepp 1929, Kangro 1939, Kirs 1949, Nugis 1949, Rajando 2002, Rekand 1922, Valk-Falk 1992). However, for the present discussion, another important source of information has been manuscripts (Kaaret 2000, Nõmmeots 1947 and Nõmmeots 1949, Rajando 2005, Rajando 2008) and also information about leather processing methods collected by the correspondents of the Estonian National Museum (ERM KV 66, ERM KV 237). In the following, I will give an overview of domestic leather processing methods that have been used in Estonia. In the second part, I will describe my own tanning experiments with a fermented flour mixture in more detail.

### Leather processing

Leather processing is the procedure of subjecting a raw hide to various mechanical and/or chemical treatments. Different treatment methods will give the leather different properties. Every stage in the leather production process is directed towards getting a product with certain properties.

The properties of a raw hide depend on the species, breed, sex, age, and nutrition of the animal, but also on the animal's lodging and living conditions, on climate, the time of slaughter and how skillfully it was skinned. The best hides are obtained from August to December, and these are the skins of young, strong, well-fed and healthy animals. Thus, it could be said that taking care of the skin already starts when it is still worn by the animal. (Rajando 2008: 12.)

The processing procedure can be divided into three main stages:

- 1) preparatory works (skinning, cleaning, unhairing);
- 2) tanning (processing the prepared skin with tanning substances);
- 3) finishing (washing, greasing, stretching, polishing).

Tanning is understood as the process of saturating a skin or hide with tannins. The process of tanning consists of either soaking the skin in tannin solution or covering the skin with tanning mixture, thus causing the tannins to penetrate in between the fibers of the skin so that the leather cannot bloat and then contract in drying.

Different raw hides, tannins and processing methods give us different results. According to the tanning substances used, tanning methods could be divided into:

- 1) vegetable tanning – leather fibers are saturated with plant tannins;
- 2) tawing – skins are tanned with alum salts (potassium alum,  $\text{AlK}(\text{SO}_4)_2 \times 12\text{H}_2\text{O}$ );
- 3) flour tanning – soaking the skin in a fermented cereal mixture made of wheat, barley, oats or rye flour to influence the skin with enzymes formed during the fermentation process.

There are also tanning methods combining various substances and stages. In the Estonian tradition, combining methods has been used, e.g., during the pre-tanning stages. The main method has been soaking the skin first in a fermented cereal mixture and afterwards continuing with vegetable tanning (Rajando 2008: 13). Another traditional method of tanning has been the so-called ‘wet white’ method. As the name indicates, the aim of this method was to produce white-coloured leather. For that purpose, raw hide was pre-processed with fermented cereal and afterwards soaked in a solution of alum and salts. After World War I, domestic tanning methods also included producing brown and black sheepskins (ERM KV 237:157). For that, skins tanned with rye or oatmeal were soaked with macerate of ash bark tinted with green vitriol or iron(II) sulphate (ERM KV 237:144).

In the following section, I will describe these skin and hide processing methods in more detail.

### Untanned skins and hides

In earlier times, skins and hides with the most primitive processing, i.e. untanned or semi-tanned hides, were widely used. We have data that in the 18th and 19th centuries, and even in the 20th century, Estonians often made traditional footwear (*pastlad*) using skins that were called ‘raw’ (*toores*) or ‘untanned’ (*pargita*, *parkimata*); in eastern parts of northern Estonia, they were called *raagnahk* (‘underdone skin’), in Mulgi County *tõprannahk* (‘beast skin’), and on the island of Muhu *öötnahk* (‘belt skin’) (Rajando 2008: 15). Untanned leather is sensitive to moisture and temperature variations.

Traditional footwear made of untanned leather were called *karvapastlad* or *karvanahka pastlad* ('hairy footwear'), indicating that hair was not removed from the skin. In many regions, *pastlad* were entirely made of hairy skin or had hair at least on the soles of the footwear. *Pastlad* made of untanned skin turned hard when dry, and thus they had to be soaked before wearing. On the other hand, in wet weather, this type of footwear stretched out and lost their durability. Several readily available methods were applied to make the leather of *pastlad* more durable – the leather was preserved in smoke-filled spaces or on cross-poles used for drying grain; the leather was smeared with ashes; the footwear were greased with lard or birch tar or soaked in brine. (Rajando 2008: 15.)

It is also known that on the island of Kihnu, the skins of hares and cats were used in their raw, unprocessed form. These skins were used as a carpet in front of bed, or they were worn under the clothes, next to bare skin, to treat stomach and intestine problems and to keep the body warm. The pelts of hares, squirrels and other animals were treated only with table salt. (Rajando 2008: 15.)

Untanned skins and hides (raw hides, pelts) were also used for making straps and harnesses. Raw hides were kneaded and stretched until they became very flexible, and some greasy substances were pressed into them. Grease will keep the skin soft and pliable and will not let moisture penetrate (Nugis 1943: 11). Greases that would not go rancid, such as seal blubber or fish oil, were used. This kind of skin processing is totally different from tanning the hides for *pastlad* with tannins obtained from barks, since processing by kneading and applying grease will leave the hide essentially raw. Since vegetable tannins build chemical bonds within the skin, it would not be possible to remove them mechanically, while in the case of rawhide, greasy substances build a minimal amount of chemical bonds within the skin, and thus it would be possible to separate the grease from the skin using mechanical methods such as washing or pressing. After degreasing, all the properties of a raw hide are restored – after soaking and drying, the material will become hard and inflexible and may break. (Nugis 1943: 11.)

The structure of an untanned skin or hide is not stable; in contact with water, the distance between collagen molecules that form the main body of a skin or hide increases, and in drying the distance decreases, because one bad thing about collagen is its poor water resistance. In cold water, collagen swells significantly, and therefore, untanned skin is soft and stretchy. During drying, the collagen shrinks, causing the skin to become hard and brittle. Hot water causes denaturation of collagen. Untanned animal skins are also edible for all types of microorganisms, and especially in wet conditions, they will mold

and rot easily (Rajando 2008: 16). Therefore, continuous maintenance of harnesses produced from kneaded skins (*muljumine*; in some regions called also *vinnamine*, ‘heaving’, or *naha väljapeksmine* ‘beating out the skin’ – see Viires, Vunder 1998: 188) was especially important for their preservation: the straps must be frequently greased, and only then will these straps stay soft and strong (Nugis 1943: 11).

Mechanical processing of skin starts with removing the hair – fine sand or ash is sprinkled on the dried skin, and the hair is removed by scraping it with a wooden wedge. This way, the hair is removed from the surface of the skin only. Another common method of unhairing is using lime – with this method, the hair breaks away with the hair follicles and the upper layer (epidermis) of the skin. This treatment gives us softer and more flexible leather.

Unhaired hides cut into straps are then greased with birch tar or a mixture of seal blubber and animal fat, and they are then bundled up and hung on a beam to dry with one end weighed down. Then the twisting of the leather starts. Together, the straps are twisted in one direction and then in the other direction, using either a special machine or a stick pulled through the twisted straps. Leather must be kneaded and stretched until it becomes soft and opaque, and if birch tar is used, tawny in colour – only then is the leather properly soaked with tar or grease and ready for use. Twisting lasts for five to ten hours and must be done during hot weather or in a well-heated room – then the leather is more easily impregnated with tar, and the process is quicker (for a detailed description, see Nugis 1943: 11–14; the same process is also depicted very well in an illustration in Viires, Vunder 1998: 188).

### Vegetable tanning

Vegetable tanning uses plants rich in tannin. Bark suitable for tanning is gathered from oak, spruce or willow, but also from pine or alder; of herbaceous plants, bearberry, blueberry or meadowsweet could be used. Gathering barks is easier during springtime when the bark is loose on the tree trunk. Pieces of gathered bark are dried in the sun. For tanning, bark is broken into small pieces to facilitate extraction of the tannins.

Tannins form horizontal bonds between protein chains, thus reducing the mobility of collagen. Attention must be paid not to start tanning with too strong a tanning solution, otherwise the tannins penetrate only the upper part of the hide, which turns dense and will not let the tannins move on, thus leaving the interior part of the hide untanned. Therefore, the process should start with weaker tannin solutions, moving gradually to stronger extracts. The strength of a tanning solution depended on plants and the type of skin used, but no tools were used to

measure it. Calculations on how much tannin should be added were made based on experience. For tanning, barks and other parts of vegetation used could also be left soaking together with the skins, but then the leather would be unevenly coloured (see Photo 1).<sup>1</sup> If an infusion is made out of plant material from which the plants are then strained out, the colour is more even.

Vegetable tanning depends on the thickness of the skin and on the tannins, and thus the duration may vary from one to six months, or up to two years if the process takes place outdoors. In the first tanning infusion, skins are soaked for a short period, but the period lengthens with every new, stronger solution. The number of tanning solutions depends on the skin tanned and its intended purpose; for thinner skins, three to four different solutions may be used, while for thicker hides of older animals, the number of solutions is larger. To know whether the hide is thoroughly tanned, a small piece is cut from the edge of the skin. The cross-section of a thoroughly tanned skin is uniformly dark, but if the center is lighter with a black line on the surface, the tanning process is not finished yet, or the first solution was too strong (Aamissepp 1920: 22–23). When the hides are taken from the tanning solution, they are left to drip and then are greased. Then they are dried completely and stretched. Vegetable-tanned leather was traditionally used for making footwear and straps.



**Photo 1.** A skin tanned with willow bark. Since the pieces of the bark remained in the solution, the colour is uneven.

### Tawing

In Estonia, the most common mineral substance used for preparing leather has been alum; processing the hides or skins with alum is also called mineral tanning. This method utilizes both alum (hydrated double sulfate salt) and table salt. Without table salt, alum would not tan hides since its acidity bloats the hide, and no chemical bonds are formed. Salt functions to absorb water out of the leather fibers, thus preventing bloating.

<sup>1</sup> All photos in this article are from the private collection of the author.

Tawing takes place quickly; the leather obtained is tough, very tear-proof, air-permeable and warm. However, the water retention properties of alum are small; therefore, if the leather gets wet, most of it will be washed out. Only about one percent of the alum forms permanent bonds in leather. Tawed leather, if washed, turns slippery and hardens in drying. Since only a tiny amount of the tanning agent forms permanent bonds, the fibers in leather with this type of tanning are flat and can be called “empty”. To reduce the moisture-sensitivity of tawed leather and fill in the fibers, several excipients, such as flour, egg yolk or oil, are added to the main tanning substances (Kangro 1939: 28).

Tawing would take from a few hours to several days, depending on the thickness of the hide. The next stages (greasing, drying, stretching and finishing) are similar to those used with vegetable tanning and tanning with fermented flour mixture.

### **Tanning with a fermented flour mixture**

A fermented flour mixture has been traditionally used for tanning sheepskins. For making the tanning solution called *apatus* (in some dialects there are other versions like *südaapatus*, *südaapatis*, *apats*, etc.; see ERM KV 66: 357–391), 1 kg of oatmeal or rye flour is beaten into 10 liters of warm water, and this mixture is left in some warm place to ferment. Later, 2 liters of strong brine are added (Nugis 1943: 6). Another possibility would be to use two handfuls of flour and one handful of salt for every skin (information from Sangaste; ERM KV 66:295–298). In some places, such as Ruhnu, potatoes have also been added to the *apatus* (ERM KV 237:168).

If several skins are tanned at the same time, the skins are paired, flesh-sides together, and arranged in a stack. The tanning solution is poured over them, and the skins are left to soak in some warm place. Depending on the thickness and age of the skins and the temperature of the tanning environment (summer or winter, indoors or outside, etc.), the skins are re-stacked now and then, and during every re-stacking, about 1 kg of flour and a handful of salt are added for every pair of skins.

In the fermenting mixture, the life processes of microorganisms produce enzymes that dissolve the adhesive substance between the skin fibers. Therefore, after tanning, the leather is fluffier and does not turn hard during drying. Table salt hinders the reproduction of microorganisms that may cause rotting. If table salt is not added, wool may fall off the skin (Nugis 1943: 7).

Tanning with a fermented flour mixture will take up to one month. In a warm room, the process is quicker, but in a cool environment, it takes more time. To check whether tanning is thorough, a test strip is cut from the skin. If

the strip has a raw, fat-like layer in the middle, or if the strip turns hard in drying, the skins need more soaking.

Skins tanned with a fermented flour mixture are sensitive to moisture. After tanning, the mixture is washed off with water or scraped down from the flesh side. Then follows greasing, drying, stretching and finishing, as in vegetable tanning or tawing.

### Traditional tools used for tanning

A good overview of tools used for processing skins and hides in Estonia can be obtained from descriptions and drawings by a tanner, Emilie Edasi (born 1901), from Kanepi. I rely here on her explanations found in a manuscript preserved in the archive of the Estonian National Museum (ERM KV 237:29/224–225). For domestic tanning, the following tools are needed:

A **vat** with a capacity of about ten buckets of liquid plus 10 average sheepskins (Figure 1).

A **stretcher** (Figure 2) is made out of a good-sized (slightly over one meter) stick with a branch. A rod with a square cross section and two sharp bottom edges is inserted between the stick and its branch. The surface of the branch must be very smooth to avoid damaging the leather. A loop made of a leather strap is attached to one end of the stick, and this is where the user's foot goes. The upper end is held



Figure 1. Vat for tanning hides.  
ERM KV 237:29/224.

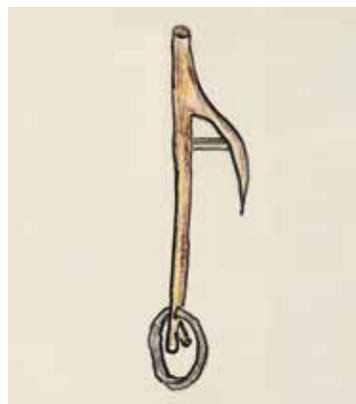


Figure 2. Stretcher.  
ERM KV 237:29/224.

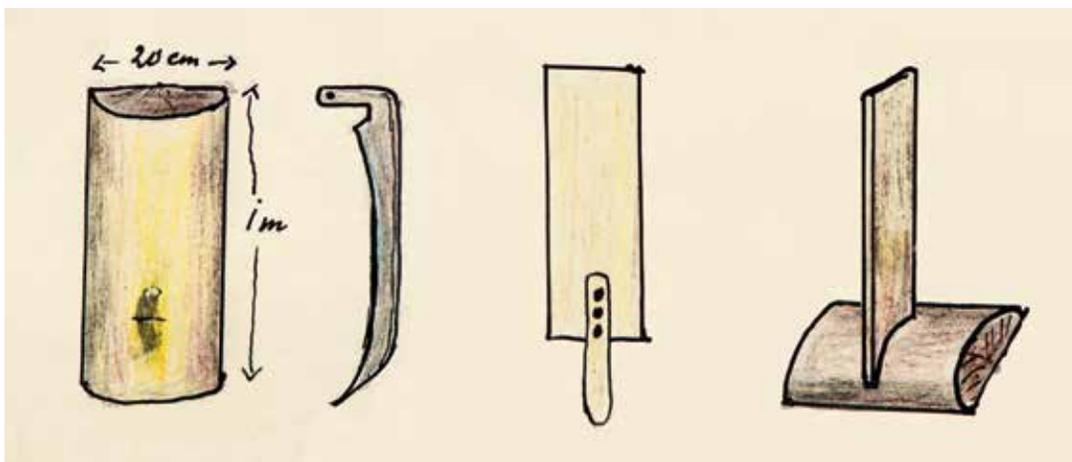


Figure 3. Block of wood and scythe; thresher; *präänits*. ERM KV 237:29/224–225.

with the right hand, and the tool is moved on the surface of the leather. The leather being processed must be hanging and tied securely. The left hand is for holding the skin, and the tool is in the right hand (Figure 3; a good illustration of this process could also be found in Viires, Vunder 1998: 188).

Tools for cleaning the skins of fat and membranes were a **half block of wood** with a smooth surface and a sharp **scythe**. Handles made out of rags were attached to the both ends of the scythe. The block of wood was braced against the worker's ribcage below the chest, and the scythe was used to scrape the skin on this block. This work demanded the utmost precision in order to avoid cutting any holes in the skin, which would mean spoiling the leather. (Figure 3, left.)

To clean tanning waste from the wool, the tools used were the common **scutching sword** (*rabaja*), intended for swingling or scutching flax (Figure 3, center), and a **stand** called *präänits*, which was also made following the principles of swingling flax (Figure 3, right) and was used for supporting the skin. The latter was also made of a half block of wood which had a cut crosswise and a horizontal plank wedged into this cut. These tools were used to scutch loose wool and the residues of tanning out of the wool. Also, the leathery surface of the skin was scutched.

### **Tanning skins with a fermented flour mixture: personal experiences**

The following is based on my personal experiments in tanning 16 sheepskins. From August 2009 to August 2010, I processed the skins of Estonian native Ruhnu sheep for my final thesis in the department of Estonian Native Crafts of the University of Tartu Viljandi Culture Academy. For tanning the skins, I used a leather tanning bench (Photo 2) and hand scrapers (Photo 3).

**Salting.** The first stage was cleaning major meat and fat residues from the skins and salting them using coarse salt. Salting is necessary to wipe out the microorganisms and avoid rotting; salt also binds to water and takes excess moisture out of the skin. The first salting takes place a few hours after skinning. I covered the flesh side of each skin with a thick layer of salt and rolled it up so that excess liquid could run out. I did the second salting about a week later. I removed wet salt from the skins and replaced it with a clean and dry salt layer. I rolled the skins up again and left them standing in a larger tub that was kept in a cool, brick cowshed until it was time to start tanning (Photo 4).

**Cleaning.** Before tanning, I cleaned the salted skins thoroughly of fat and meat residues (Photo 5). For this work, I fixed the skin on a leather tanning bench (Photo 2). I mainly used a small scraper for this work (Photo 3).

**Washing.** When the flesh side of each skin was cleaned, I washed the wool sides with wool shampoo and rainwater. During washing, it is important to



**Photo 2.** Leather tanning benches. The left one is for stretching skins, and the right one is for cleaning skins.



**Photo 3.** Hand scrapers. The smaller one is for cleaning and stretching skins, and the larger one is for stretching and polishing skins.



**Photo 4.** Salting the skins.

take care that dirt coming from wool would not soil the clean flesh side, since blood and manure from wool may penetrate into the skin and soil it permanently. For washing, I put the skins on the table, flesh side down, and washed the majority of the dirt out of the wool on the upper side. Then I rinsed the skins in a rainwater vat. The most suitable temperature for washing skins is about 30–35°C. After washing, I left the skins in cool, clean water to leach out salt that otherwise might hinder the tannins' penetration into the skin. The skins were left soaking for a few hours or up to all night, according to the amount of salt in them. When the flesh side of a skin was no longer salty, I took it out and left it hanging until the wool side was dry. The skins that I washed in the late autumn I spin-dried in a washing machine, since the wool would not have dried outdoors.

**Tanning.** The tanning solution – the fermented flour mixture – was left fermenting for about five days before tanning. For the mixture, I combined 1 kg of rye flour with hot water to get a sourcream-like batter that was left to ferment in a warm place. Right before applying it to the skin, I added brine that was made of 300 grams of fine table salt and one liter of hot water. In addition, I mixed about 1 kg of rye flour and some water into the fermented mixture to obtain a thick dough. I rubbed this dough onto the flesh side of the skin so that the entire skin was covered with the mixture (Photo 6). The mixture must be warm when you apply it to the skin. I laid the skins out on a flat surface and turned the edges up over the fermented dough so that the skin side was completely covered, leaving only the wool side exposed (Photo 7). The mixture remained on the skin for 24–48 hours; then I added some rye leaven that I had left in a warm



**Photo 5.** Cleaning residual fat and meat from the skin using a small hand scraper.

place the day before to get the mixture re-started (Photo 8). Before applying it to the skin, I added some hot water to the leaven to warm it up for mixing with the fermented mixture. A week later, I mixed in some more warm leaven and left the mixture on the skin for another seven days. The skin was thoroughly tanned if, on the wool side of the skin, a thin film (epidermis) comes loose and the wool is slightly loose; the wool will be stable when the skin has dried. When the skin was tanned, I removed the mixture and let it dry a bit. Tanning one skin took from two to three weeks.

**Greasing.** When the skins were no longer dripping, I greased the flesh side with oil emulsion. For that I used 1 dl of vegetable oil, 1 dl of water in 35°C, and 1 tbs of liquid soap (soap diminishes surface tension and helps the grease to penetrate the skin). I mixed these components and rubbed the mixture into the surface of the skin.

**Drying and stretching.** After greasing, I left the skins to dry in an airy place for one week. After oiling, the surface of the skin was white, but during



**Photo 6.** A sheepskin covered with fermented flour mixture.



**Photo 7.** Tanning skins with fermented flour mixture.



**Photo 8.** Fermented rye flour mixture applied to flesh side of a skin.



**Photo 9.** Drying the tanned skin.



**Photo 10.** Drying skin tanned with alum.

drying it started turning darker (Photos 9–11). During drying, I stretched the skins two or three times per day using the large scraper to avoid the skins drying too quickly, which would leave them too soft. During stretching, the dark surface of the skin would turn lighter again (Photos 12 and 13); if stretched, the dry skin would remain white.

**Finishing.** For finishing the dried skins, I took 2 dl coarse salt and 2 dl wheat flour, mixed them and used the mixture to polish the skins. For that, I pinned the skins to the workbench again and used a tablespoon to pour the



**Photo 11.** A skin drying.



**Photo 12.** Stretching the skin.



**Photo 13.** Stretching the skin.



**Photo 14.** A skin tanned with fermented flour mixture.

mixture onto the skin. I removed it using the large scraper, slightly stretching the skin. This way, the salt brushes up residual fleshy membranes, while the flour binds the salt and also removes moisture from the skin. When the entire surface was treated with this flour-salt mixture, the following stage was to polish it with a worn, fine No. 150 sandpaper. I wrapped it around a wood-block that fit comfortably into my hand and polished the surface lightly. Thus, I obtained a nice and smooth skin surface (Photo 14).

## Final thoughts: The current state of traditional leather processing in Estonia

Traditional domestic leather processing has been in decline in Estonia since the beginning of the 20th century, when chromium tanning was invented and specialized tanners and tanneries became widespread (Viires, Vunder 1998: 188). After World War II, only a few people who had the skills were practicing tanning at home.

In the 21st century, renewed interest towards traditional tanning methods using natural materials has emerged due to the wish to preserve traditional skills, but also because we have enthusiasts interested in practicing tanning at home for whom this work is also a source of emotional satisfaction. This kind of practice goes very well with sustainability and a green lifestyle.

Since there are no longer people who are personally, through oral and manual tradition, familiar with traditional leather processing methods, the skills and knowledge of the people practicing traditional leather processing at home are based on written sources preserved in the ethnographic archive of Estonian National Museum and also in Estonian and foreign publications from the first half of the 20th century.

It is possible to study traditional leather processing methods within the specialized module of leather goods production in the curriculum of Estonian native crafts at the University of Tartu Viljandi Culture Academy. A three-day workshop on processing hareskin and ram scrotum has been included in the curriculum of Estonian native crafts at the Olustvere School of Service and Rural Economics. In recent years, there have been workshops on traditional leather processing methods in which the majority of the participants have been livestock farmers and hunters. The main motive to participate in these courses has been a wish to be able to process a small number of skins at home. Usually about a dozen people take part in these courses, but only a few of them will continue practicing traditional leather processing methods at home.

## Sources

**Aamisepp**, Julius 1920. *Kodune nahaparkimine*. Viljandi: H. Leokese raamatukaupluse kirjastus.

**Kangro**, Viktor 1939. *Naha tehnoloogia: toornaha käsitlemine, parkimine, naha liigid ja hindamine*. Tallinn: Tehniline kirjastus.

**Kirs**, Evald 1940. *Toornahk: selle kvaliteet ja käsitlemine*. Tallinn: Agronoom.

**Nugis**, Elmar 1943. *Tähtsamate nahaliikide kodune parkimine: pastlanaha parkimine, kasukanaha parkimine, raagnaha parkimine*. Tallinn: Agronoom.

**Rajando**, Kristina 2002. *Parkimine. Viltimine. Taimeodega värvimine: väike käsiraamat*. Vormsi: K. Rajando.

**Rekand, Jaan Aleksander** 1922. *Toores ja ümbertöötatud nahk ja selle eest hoolitsemine*. Tartu: G. Roht.

**Valk-Falk, Endel** 1992. Eesti nahatööd ja tema meistrid 1495–1900. – *Renovatum Anno 1992*. Tallinn: Ennistuskoda Kanut, 1–63.

**Viires, Ants, Vunder, Elle** (eds.) 1998. *Eesti rahvakultuur*. Tallinn: Eesti Entsüklopeediakirjastus.

### Manuscripts

**Kaaret, Eve** 2000. *Taimparknaha valmistamisest Eestis*. Master's thesis. Tallinn: Eesti Kunstiakadeemia nahakunsti osakond. Manuscript in the library of Estonian Academy of Arts.

**Nõmmeots, Salme** 1947. *Lambanahkade ja väikemetsloomanahkade töötlemine*. Term paper. Tartu: Tartu Ülikooli ajaloo- ja keeleteaduskond. Manuscript in the collection of Estonian National Museum.

**Nõmmeots, Salme** 1949. *Nahatöötlemine ja -töötlejad eesti külas*. Final paper. Tartu: Tartu Ülikooli ajaloo- ja keeleteaduskond. Manuscript in the collection of Estonian National Museum.

**Rajando, Kristina** 2005. *Toornaha kodusel teel töötlemist käsitlevate välikursuste õppematerjal ja korraldus* [didactic material]. TLÜ Matemaatika-Loodusteaduskond, tööõpetuse osakond. Manuscript and instructional video in the archive collection of Tallinn University.

**Rajando, Kristina** 2008. *Naha töötlemise kursus*. Manuscript in the possession of the author.

### Archival sources

ERM KV = Archive of Correspondents, Estonian National Museum

ERM KV 66 – Küsimusi rahvapärasest tehnikast I. Nahatöötlemine. [Questions of vernacular technology I. Leatherwork.]

ERM KV 237 – Kasukad. [Coats.]



Photo by Kristina Libe.

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