Effect of trimming of overgrown and deformed claws in goats on morphometric measurements

Vivian Cristina Mendes Prado [1]*, Juscelio Bassoto Filho [2], Melina Marie Yasuoka [3], Rudiger Daniel Ollhoff [4], Sarita Bonagurio Gallo [5], Eduardo Harry Birgel Junior [1,2]

[1] Faculty of Veterinary Medicine and Animal Science, Department of Surgery, University of Sao Paulo, São Paulo, SP, Brazil.

[2] Faculty of Animal Science and Food Engineering, Department of Veterinary Medicine, University of Sao Paulo, Pirassununga, SP, Brazil.

[3] Faculty of Veterinary Medicine, Department of Veterinary Medicine, Anhembi Morumbi University – Laureate International Universities, São Paulo, SP, Brazil.

[4] School of Life Science, Graduate Program in Animal Science, Pontifícia Universidade Católica do Paraná, Curitiba, PR, Brazil.

[5] Faculty of Animal Science and Food Engineering, Department of Animal Science, University of Sao Paulo, Pirassununga, SP, Brazil.

* Corresponding author: Vivian C. M. Prado. E-mail: vivian.cmprado@gmail.com

Authors' contributions:

Conceptualization: Vivian Cristina Mendes Prado, Eduardo Harry Birgel Junior;

Methodology: Vivian Cristina Mendes Prado, Eduardo Harry Birgel Junior;

Formal analysis and investigation: Vivian Cristina Mendes Prado, Juscelio Bassoto Filho, Melina Marie Yasuoka, Rudiger Daniel Ollhoff, Sarita Bonagurio Gallo, Eduardo Harry Birgel Junior;

Writing - original draft preparation: Vivian Cristina Mendes Prado, Juscelio Bassoto Filho, Melina Marie Yasuoka, Rudiger Daniel Ollhoff, Sarita Bonagurio Gallo, Eduardo Harry Birgel Junior;

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ABSTRACT

Reduced welfare and productivity of dairy goats have often been associated with poor claw health, especially conditions such as claw overgrowth and deformations. It is known that periodic claw trimmings have prophylactic and therapeutic effects on these problems, and this study aimed to evaluate if the additional use of an angle grinder to finish trimming overgrown and deformed goat claws, after the usual trimming using hoof shears, could provide further changes in these claws. For this, twelve Saanen goats (57.29 ± 11.15 kg of body weight, 3.08 ± 1.78 years old) were selected by presence of severe claw overgrowth, and absence of claw alterations of other nature. Their claws were trimmed in two steps, first using hoof shears and then using an angle grinder. Morphometric, baropodometric, and conformational aspects of all claws were assessed before claw trimming and after each trimming step. To analyse the effects of the trimming steps in each claw, the Tukey's test was used on parametric data, with 5% probability, and descriptive statistics were used on non-parametric data. Although this is a small pilot study, results suggest that using an angle grinder after the use of hoof shears, could further reduce heel length and sole width of claws, as well as reduce the number of deformed claws. The incorporation of the second trimming tool, could also further increase the frequency with which the point of maximum pressure was found in the toes, rather then in the heels of the claws as seen in deformed claws.

KEYWORDS: claws, overgrowth, deformations, angle grinder, baropodometry, morphometry.

INTRODUCTION

Goat claws are adapted to resist constant wear over hard, steep and dry ground (Zobel et al. 2019) and, when raised in farms, overgrown claws become a common problem, affecting more then half of animals within herds as shown in many different studies (Hill et al. 1997; Anzuino et al. 2010; Ajuda et al. 2014; Hempstead et al. 2021). Lack of trimming is one of the predisposing factors for this condition, which is known to be highly associated with lameness (Hill et al. 1997; Eze 2002; Ajuda et al. 2019; Deeming et al. 2019; Anzuino et al. 2010), impacting goats welfare (Anzuino et al. 2010; Battini et al. 2015; Can et al. 2016), and production (Eze 2002). Therefore, especially in confined goat herds, periodic claw trimming should be performed over two times a year (Battini et al. 2014; Christodoulopoulos 2009) to rectify claw imbalances, reduce deformations and minimize possible inflammatory claw conditions associated with overgrowth (Ajuda et al. 2014).

Slippered foot, a condition characterized by altered pressure distribution on goats' claws, with overburden of its heels (Hill et al. 1997), is a kind of deformation associated with claw overgrowth (Ajuda et al. 2014; Ajuda et al. 2019). Most studies of claw pressure distribution were made using baropodometry technics in cattle and sheep (Carvalho et al. 2006; Telezhenko et al. 2008; Oehme et al. 2018; Nuss et al. 2019; Ferrer and Ramos 2016), but not yet in goats. It is well known, in cattle, that pressure is not equaly distributed between claws or regions of claws (Van Der Tol 2002), and in sheep, pressure is mainly deposited on its walls and heels (Ferrer and Ramos 2016). The classical Dutch trimming method foresees these claw imbalances, and aims to prevent or correct it in cows.

A normal claw morphometry of Saanen goats, according to Koluan and Göncü (2016), has length of dorsal wall, length of claw, claw width and dorsal angle from forelimbs respectively equal 3.9cm, 5.8cm, 2.0 and 59.6°, and of hindlimbs equal 3.7cm, 5.3cm, 1.7cm, 58.7°. Other researchers show different values for some of these measurements (Arun 2015; Ajuda et al. 2019).

For goats, claws with a wall overgrowth of more than 2.5cm can be considered severe, according to Anzuino et al. (2010), and one of the most popular tools used for trimming this exceeding horn tissue, are hoof shears (Smith and Sherman 2009). This tool can easily be purchased and handled, but should be kept sharp, and the handler should be trained to trim the claws without causing injuries (Brandão 2020). Attention to the equipment and the technique is also important when using angle grinders to sand claws, causing no injuries to the animals, due to excessive abrasion or overheating of structures, when handled by a trained person (Blowey 1998; Ferrer and Ramos 2016).

In sheep, angle grinders are used to speed the process of hoof care, specially when dealing with a great number of animals (Ferrer and Ramos 2016). The angle grinder can also be used to perform more precise paring of claw surfaces in goats (Koluan and Göncü 2016), and according to van Amstel and Shearer (2006), cattle claws with excessively rigid and deformed horn tissue, can benefit from the progressive sand of these structures through the use of an angle grinder. Such applications of the angle grinder could be further explored on goats claws.

Considering that claw overgrowth affect great percentage of goats, specially on large farms (Can et al. 2016) and that many farmers still refrain from performing adequate claw care (Mordia et al. 2018; Boz 2015; Aguiar et al. 2011; Arun 2015; Hill et al. 1997; Hempstead et al. 2021), the importance of further exploring new and effective claw trimming techniques, is shown. The lack of informations about claw conformation and lesions in goats are also significant, if compared to other domestic species (Deeming

2019; Hill et al. 1997), therefore, this study aimed to evaluate if the additional use of an angle grinder to finish trimming overgrown and deformed goat's claws, after the traditional trimming using hoof shears, could provide further morphometric, conformational and baropodometric claw changes.

MATERIALS AND METHODS

The experimental procedures were approved by the Ethic Committee on Animal Use of the Faculty of Animal Science and Food Engineering - University of Sao Paulo. In this study, twelve non lactating female Saanen goats (mean ± SD, 57.29 ± 11kg body weight, age 3.08 ± 1.7 years), from the herd of the Faculty of Animal Science and Food Engineering at the University of Sao Paulo, were used. These animals were selected by presence of severe claw overgrowth according to Anzuino et al. (2010), having over 2.5cm of exceeding horn tissue, and absence of claw alterations of other nature, such as infectious claw disease. The animals were kept in the same stall with a concrete floor, without bedding, in an area of 50m² and their diet consisted of corn silage and water ad libitum, balanced feed for goats in maintenance, and mineral salt for goats.

Claw trimming was performed twice a year in these animals and in the autumn, at the time of the experiment, six months after the last trimming, their claws were submitted to a two step trimming process by an experienced veterinarian. For the first step, a pair of hoof shears for small ruminants were used (Fig. 1a) and, for the second step, an angle grinder from *SKIL*™, model 9002, 650W and 10.000rpm (Fig. 1b), equipped with sanding flap disc from *Lotus*™, model 4026, with nylon resin and zirconia alumina, 40-Grit, 114.3mm diameter was used, enabling refinement and finishing of the claw trimming (Fig. 1c).

The first step, trimming with hoof shears, consisted of paring the excess horn tissue from abaxial and axial walls of the claw, that often were folded, and from the heels of the claws as necessary to assure the line of the claw bearing surface was parallel to the coronary band. The second step, refinement of the trimming using an angle grinder with a sanding disc, initially aimed to correct possible irregularities in the leveling of the bearing surface of walls, sole and heel, then it was used to shape the axial region of the heel and wall, where much keratinized tissue folds itself specially when the claw is axially rotated and, finally, to straighten the surface of the abaxial walls. Both trimming steps were performed with the animal in lateral recumbency that was placed on a mat and restrained by an assistant, allowing the tool operator to adequately shape the claw horn. In neither step of the trimming process the animals showed lameness, as confirmed by assessment of locomotion score proposed by Anzuino et al. (2010). The hardness of wall horn measured by a type D Shore Durometer from *Teclock™*, and sole thickness assessed by digital sole compression, had no important changes in their values, suggesting adequate preservation of the claw structure.

During the experiment, all 96 claws of the 12 selected goats were analysed, and data were collected three times by the same person: before claw trimming; after trimming with hoof shears; after use of the angle grinder for refinement and finishing of the first trimming step.

Morphometry

Using an electronic digital caliper from *MTX*™, model 316119, with maximum permissible error of 0.02mm, each claw of the selected goats was sistematicaly measured three times: before claw trimming; after trimming with hoof shears; after use of the angle grinder for refinement and finishing of the first trimming step. The collected data were: dorsal length (distance from the most dorsal point of the coronary band to the tip of the toe), sole length (distance from the most caudal point of the heel, to the tip of the toe), heel length (distance from the most caudal point of the coronary band to the most caudal point of the heel) and sole width (distance between the axial and abaxial walls of the claw, at its widest point) (Fig. 2).

Images

Images obtained from the dorsal, lateral, and palmar/plantar aspect of each claw of the goats standing still and supporting its weight on the four limbs, allowed further assessment of the claws before trimming, after trimming with hoof shears, and after use of the angle grinder for refinement and finishing of the first trimming step. The software used to process and analyse the images was *Fiji/ImageJ* (Schindelin et al., 2012) which enabled measurement of additional morphometric traits: claw angles (Fig. 3a), and sole areas. The actual sole areas of the claws were measured by positioning a tape on the hands that held the claws at the time of the image capture, to provide a reference, with known width, to the conversion of pixel values in the image, to centimeters (Fig 3b; 3c). Classification of claw deformation was also performed through image analysis, being identified as deformed claws, the ones who were rotated or had lost its natural triangular form, as described by Ajuda et al. (2019).

Baropodometry

Static baropodometric examination of goats' footprints determines the pressure applied by each individual point of the claws over the ground and allows the localization of the point of maximum pressure. With this intent, a *Baroscan*™ baropodometry platform from *Podotech*™, with 4096 pressure sensors and an active area of 2500 cm^2, and its *Barosys*™ software version *1.6 beta*, were used in this study.

Examinations were performed in each animal by placing its fore limbs over the platform, until balanced and still to allow the software to process baropodometric records with acquisition frequency of 500Hz, during 5 seconds. The same procedure was repeated for hind limbs. All animals were examined before trimming, after trimming with hoof shears, and after use of the angle grinder for refinement and finishing of the first trimming step.

The location of the maximum pressure point of each claw was determined first by measuring the longitudinal axis of their footprint through the software, then subdividing this axis into three equidistant segments (anterior/toe, middle/sole center, and posterior/heel), separated by imaginary transversal lines. This process allowed settlement of the point of maximum pressure in one of the three claw regions (Fig. 4).

Statistical analysis

Statistical analysis were performed to evaluate if additional use of an angle grinder to finish trimming overgrown and deformed goat's claws, after the traditional trimming using hoof shears, could provide further claw changes. For this, all 96 claws from the 12 selected goats were assessed. To analyse parametric data, represented by the morphometric traits in this study (dorsal length, sole area, claw angle, sole length, sole width and heel length), the claws were subdivided into four types: lateral claws of fore limbs; medial claws of fore limbs; lateral claws of hind limbs, and medial claws of hind limbs. To analyse non-parametric data (deformation and location of the maximum pressure point), the claws were not subdivided.

The parametric analysis were performed through the computer program *Statistical Analysis System* (*SAS version 9.3*), testing for normality using the Shapiro-Wilk test, the Proc GLM, Tukey test with 5% as significant level, to compare the morphometric traits of each type of claw before and after every step of the trimming process. For non-parametric analysis, the comparison of claws before and after each step of the trimming process was performed using descriptive statistics.

RESULTS

Claw trimming using hoof shears created a significant decrease in dorsal length of lateral claws of fore limbs ($P < 0.0001$), medial claws of fore limbs ($P = 0.0005$), and lateral and medial claws of hind limbs ($P < 0.0001$) and also in the sole area of all assessed claws ($P < 0.0001$); the additional use of the angle grinder after the trimming with hoof shears, in turn, did not amplify these changes. Claw angle values were increased in lateral claws of fore limbs ($P = 0.0116$), medial claws of fore limbs ($P = 0.0009$) and lateral and medial claws of hind limbs ($P < 0.0001$) after trimming with hoof shears but remained unchanged with the additional use of the angle grinder.

None of claw interventions affected sole length values of lateral claws of fore limbs ($P = 0.5931$) and medial claws of fore limbs ($P = 0.1833$), but in lateral and medial claws of hind limbs, the trimming using hoof shears significantly reduced it ($P < 0.0001$), while additional use of the angle grinder after the hoof shears, did not cause further changes in these values. The hoof shears did not influence sole width of the claws or its heel length; however, additional use of the angle grinder after the hoof shears, was effective in reducing sole width in lateral claws of fore limbs ($P = 0.0010$), lateral claws of hind limbs ($P = 0.0767$), medial claws of hind limbs ($P = 0.0024$) and reduce heel length on lateral claws of fore limbs ($P < 0.0001$) medial claws of fore limbs ($P = 0.0002$), lateral claws of hind limbs ($P < 0.0001$) and medial claws of hind limbs ($P = 0.0006$) (Table 1).

The percentage of deformed claws was reduced from 84.37% (81/96) to 42.71% (41/96) after claw trimming using hoof shears and to 16.67% (16/96) after additional use of the angle grinder to refine and finish the first claw trimming. Regarding the distribution of the maximum pressure points in claw regions during the claw trimming process, initially, before any claw intervention, the heel was the region that most frequently received the maximum pressure point, with 61.46% (59/96) of the claws showing maximum pressure points in this region. After claw trimming using hoof shears, only 43.75% (42/96) of the claws had maximum pressure points on the heels and, conversely, the number of claws with maximum pressure points found on the toe rised from 20.83% (20/96) to 31.25% (30/96). A greater increase in the number of claws with maximum pressure point located in the toe region, occurred after the additional use of the angle grinder to refine and finish the claw trimming, reaching 43.75% (42/96) of the claws. The number of claws having the center of the sole as the region where the maximum pressure point was located, remained relatively constant throughout the trimming process (Table 2).

DISCUSSION

This study shows that additional use of an angle grinder after the use of hoof shears, when trimming goats' claws, can be effective in further reducing its sole width and heel length, since this tool allows a more precise thinning and fine sanding of the horn (Koluan and Göncü 2016), being presumably useful for specific purposes.

In cattle, according to Toussaint Raven (1985), careful trimming of axial claw walls and modeling the axial site of the sole ulcer site, can reduce its sole width, widenning its interdigital space, and in those claws axially rotated, that grows horn mostly towards the interdigital space, pairing the axial region is much needed (van Amstel 2017). Attention to overgrowth in this region of cattle claws is relevant to prevent local accumulation of dirt (van Amstel and Shearer 2006) important predisposing factor to foot rot, especially on rainy seasons.

On lateral claws of hind limbs, however, the sole width did not change statistically after any step of the trimming process. Their absolute values, though, were similar to those of the medial claws of hind limbs, which showed a significant change in sole width when the angle grinder was used to refine and finish the initial claw trimming with hoof shears. The disparity of these specific claws could be expected when considering that in different ruminant species, hind limb claws are more prone to disturbance (Ajuda et al. 2014; Hill et al. 1997; Muggli et al. 2011; Keller et al. 2009) and, in goats, mostly lateral claws are (Arun 2015). This could implicate that lateral claws of hind limbs are more difficult to shape, and could be one of the claws that can not have its structural normality restored through trimming (Ajuda et al. 2019).

On fore limb claws, the sole length was always the same before and after both steps of the trimming process, and this may be due to its greater wear (Ajuda et al. 2019). Hind limb claws, on the other hand, had a significant reduction in sole length after being trimmed with hoof shears, probably due to the greater and more frequent accumulation of excess horn tissue in these claws, when compared to the claws of fore limbs (Ajuda et al. 2019). The additional use of the angle grinder after the trimming with hoof shears, was not effective in promoting a significant difference in sole length values on fore and hind limbs, therefore its use may not be necessary in this case.

Hoof shears alone, also showed to be effective when shaping and correcting the claw's angle, dorsal length and sole area, since the additional use of an angle grinder after the trimming with hoof shears, did not significantly change these morphometric traits.

After the trimming using hoof shears, as well as after the additional use of the angle grinder to finish the trimming, there was an evident decrease in the prevalence of deformed claws. The improvement in claw conformation, promoted by the use of the angle grinder in addition to the hoof shears, may be related to the fact that this tool changed two morphometric traits further then the hoof shears alone could: sole width and heel length. It also shows that if only the hoof shears were used, as occurs in many farms (Smith and Sherman 2009), probably overgrown and deformed claws would not benefit from the further improvements that an angle grinder could promote.

In each step of the trimming process, there was a change in distribution of maximum pressure points on goats' claws. Pressure distribution in cattle claws can also be influenced by trimming techniques (Telezhenko et al. 2008) and claw deformation (van Amstel and Shearer 2006; Hinterhofer et al. 2007). In this study, the frequency with which the maximum pressure points were located in the toe tended to increase, and in the heel decrease, after trimming with hoof shears and also after additional use of the angle grinder for refinement and finishing of the claw trimming. This demonstrates a change in the pattern showed by some overgrown claws, the pressure of which is deposited mainly on the heel (Ferrer and Ramos 2016) causing a condition sometimes referred to as "slipper hooves" also found in goats (Hill et al. 1997), characterized by exacerbatedly deepened heels and downward inclination of the coronary band (Deeming et al. 2019).

Overload of certain regions of cattle claws can predispose them to lesions (Hinterhofer et al. 2007; Telezhenko et al. 2008) and, as the trimming process restore the normal shape of the claws, with its greater toe angles, pressure is usually anteriorized (van Amstel and Shearer 2006), as was also noticed in goats throughout this study. In sheep, when body weight is transferred forward towards its claw walls, its vertical structure is capable of better supporting the weight (Ferrer and Ramos 2016). Assuming that goats have claw biomechanics similar to sheeps, the forward weight shift promoted by trimming techniques can be beneficial for them as well.

Although this is a small pilot study with limitations, the results suggest that using an angle grinder to refine and finish the trimming done with hoof shears, would benefit goats with severily overgrown or deformed claws. The additional use of the angle grinder further reduced heel length and sole width of claws, which can be associated to the reduction in the number of deformed claws this tool promoted even after previous trim with hoof shears. The use of the angle grinder in association with the hoof shears also contributed to improve pressure distribution of claws, moving the point of maximum pressure from its heels to the toes.

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STATEMENT OF ANIMAL ETHICS

The experimental procedures were approved by the Ethic Committee on Animal Use of the Faculty of Animal Science and Food Engineering - University of Sao Paulo (CEUA number 5542160120, approved on July 02, 2020).

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest

DECLARATIONS

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Authors' contributions:

Conceptualization: V. C. M. Prado, E. H. Birgel Junior; Methodology: V. C. M. Prado, E. H. Birgel Junior; Formal analysis and investigation: V. C. M. Prado, J. Bassoto Filho, M. M. Yasuoka, R. D. Ollhoff, S. B. Gallo, E. H. Birgel Junior; Writing - original draft preparation: V. C. M. Prado, J. Bassoto Filho, M. M. Yasuoka, R. D. Ollhoff, S. B. Gallo, E. H. Birgel Junior; Writing - review and editing: V. C. M. Prado, M. M. Yasuoka, R. D. Ollhoff, S. B. Gallo, E. H. Birgel Junior; Resources: E. H. Birgel Junior; Supervision: S. B. Gallo, E. H. Birgel Junior. All authors read and approved the final manuscript.

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Code availability: Not applicable

Ethics approval: The experimental procedures were approved by the Ethic Committee on Animal Use of the Faculty of Animal Science and Food Engineering - University of Sao Paulo (CEUA number 5542160120, approved on July 02, 2020).

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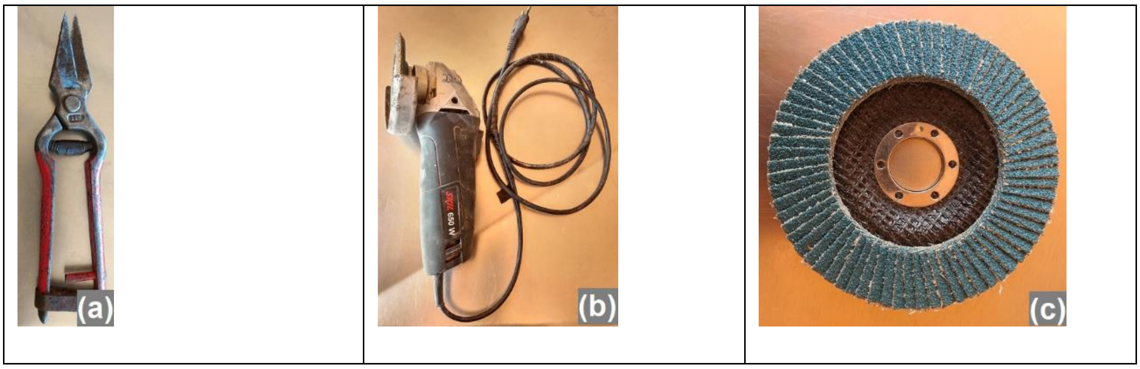
Fig. 1



Tools used for the two step claw trimming: (a) hoof shears for small ruminants; (b) angle grinder (c) sanding flap disc

Fig. 2

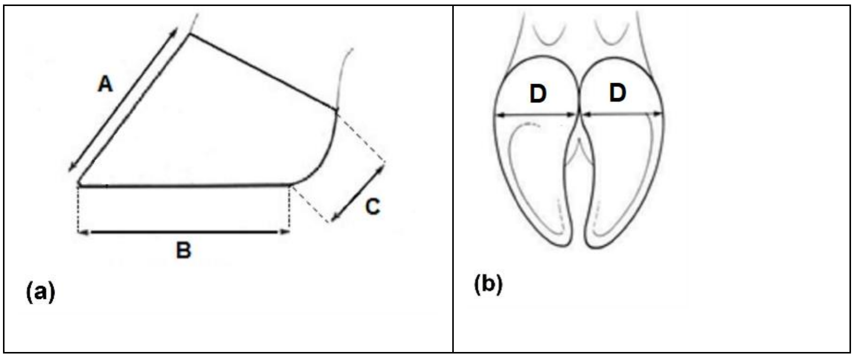
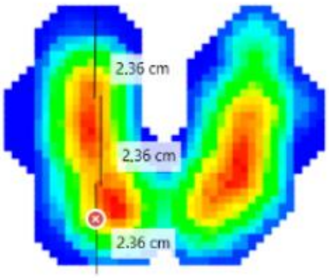


Image adapted from Vermunt and Greenough (1995), (a) lateral view of the hoof and (b) palmar/plantar view of the hooves; showing morphometric regions of interest. A = dorsal length; B = sole length; C = heel length; D = sole width

Fig. 3

Using the software *Fiji/ImageJ* (Schindelin et al., 2012), (a) the angle of the claw was measured using the *Angle Tool* that marked the required angle (red lines in the image), after three points were selected, providing its value in degrees, in the bottom box of the image. (b) To measure sole areas in cm^2, through its photographs, the conversion rate from pixels to centimeters was stablished first. For this, the known width of a tape (1cm) was selected in the image (red line over the blue tape) using the *Straight Line Selection Tool* of the software. With this information, it was possible to use of the “set scale” option (shown in the box aside) to calculate the required pixel/cm ratio. (c) The measurement of sole areas (area within drawn red borders), where then possible using the *Freehand Selection Tool*, giving its values, in cm^2, in the box aside

Fig. 4



In this baropodometric image of lateral and medial claws, the one on the left (lateral) had its longitudinal axis subdivided into three thirds (2.36cm each) in order to determine in which one of the three specific regions, is located the point of maximum pressure of the claw ("X" within the red dot)

Table 1.
Measurements of each claw of fore and hind limbs along the steps of the trimming process (means ± SE)

Claw	Step	Dorsal Length (cm)	Sole Area (cm^2)	Claw Angle (Degrees)	Sole Length (cm)	Sole Width (cm)	Heel Length (cm)
FL	BT	$4.62^{a} \pm 0.25$	$9.89^{a} \pm 0.47$	$57.61^{b} \pm 2.51$	$5.22^{a} \pm 0.21$	$2.49^{a} \pm 0.06$	$3.75^{a} \pm 0.09$
	HS	$3.51^{b} \pm 0.11$	$7.58^{b} \pm 0.30$	$66.35^{a} \pm 2.19$	$5.02^{a} \pm 0.07$	$2.53^{a} \pm 0.05$	$3.60^{a} \pm 0.09$
	AG	$3.35^{b} \pm 0.10$	$6.45^{b} \pm 0.18$	$65.09^{a} \pm 1.72$	$5.12^{a} \pm 0.08$	$2.25^{b} \pm 0.04$	$3.04^{b} \pm 0.08$
P-value		<0.0001	<0.0001	0.0116	0.5931	0.0010	<0.0001
FM	BT	$4.02^{a} \pm 0.17$	$8.30^{a} \pm 0.30$	$54.33^{b} \pm 2.02$	$5.36^{a} \pm 0.12$	$2.33^{a} \pm 0.05$	$3.40^{a} \pm 0.08$
	HS	$3.53^{b} \pm 0.13$	$6.70^{b} \pm 0.21$	$61.72^{a} \pm 1.65$	$5.13^{a} \pm 0.07$	$2.33^{a} \pm 0.05$	$3.21^{a} \pm 0.10$
	AG	$3.21^{b} \pm 0.10$	$5.99^{b} \pm 0.19$	$64.16^{a} \pm 1.83$	$5.21^{a} \pm 0.07$	$2.11^{b} \pm 0.04$	$2.87^{b} \pm 0.08$
P-value		0.0005	<0.0001	0.0009	0.1833	0.0018	0.0002
HL	BT	$4.31^{a} \pm 0.21$	$8.81^{a} \pm 0.72$	$37.36^{b} \pm 2.33$	$6.40^{a} \pm 0.24$	$2.06^{a} \pm 0.07$	$2.58^{a} \pm 0.06$
	HS	$3.08^{b} \pm 0.06$	$5.21^{b} \pm 0.31$	$48.45^{a} \pm 1.96$	$5.04^{b} \pm 0.08$	$1.95^{a} \pm 0.05$	$2.39^{a} \pm 0.05$
	AG	$2.95^{b} \pm 0.08$	$4.68^{b} \pm 0.17$	$52.81^{a} \pm 1.75$	$5.20^{b} \pm 0.08$	$1.87^{a} \pm 0.05$	$2.17^{b} \pm 0.05$
P-value		<0.0001	<0.0001	<0.0001	<0.0001	0.0767	<0.0001
HM	BT	$4.26^{a} \pm 0.16$	$7.83^{a} \pm 0.31$	$47.15^{b} \pm 0.92$	$5.56^{a} \pm 0.13$	$2.06^{a} \pm 0.06$	$2.57^{a} \pm 0.07$
	HS	$3.00^{b} \pm 0.06$	$5.13^{b} \pm 0.21$	$62.9^{a} \pm 1.84$	$4.88^{b} \pm 0.08$	$2.06^{a} \pm 0.04$	$2.52^{a} \pm 0.06$
	AG	$2.78^{b} \pm 0.05$	$4.63^{b} \pm 0.17$	$65.20^{a} \pm 1.54$	$4.89^{b} \pm 0.07$	$1.86^{b} \pm 0.03$	$2.21^{b} \pm 0.07$
P-value		<0.0001	<0.0001	<0.0001	<0.0001	0.0024	0.0006

[1]Abbreviations: Step = step of the trimming process; FL = fore limb lateral claw; FM = fore limb medial claw; HL = hind limb lateral claw; HM = hind limb medial claw; BT = before trimming; HS = after trimming with hoof shears; AG = after trimming with angle grinder;

[abc] Means with different superscripts within a column are statistically different at $P < 0.05$; SE = Standard Error

Table 2.

Frequency and absolute values with which the maximum pressure point is contained in each region of the claw along the trimming process

	Toe	Sole Center	Heel
Before trimming	20.83% (20/96)	17.71% (17/96)	61.46% (59/96)
After use of hoof shears	31.25% (30/96)	25.00% (24/96)	43.75% (42/96)
After use of angle grinder	43.75% (42/96)	21.88% (21/96)	34.38% (33/96)