

# Zoometry: a useful tool for determining the productive aptitude of domestic ruminants

## Abstract

Zoometry is a tool that allows knowing the productive capacities of domestic ruminants or their inclination towards certain productive aptitude, through the interpretation of seven functional indices such as dactyl-costal, dactyl-thoracic, longitudinal pelvic, transversal pelvic, relative depth of thorax, relative thickness of cannon bone and proportionality. Dactyl-costal and dactyl-thoracic indices indicate the format of the shape of the animal and establish a relationship between the pectoral mass and the limbs. Longitudinal pelvic and transversal pelvic relate respectively the width and length of the rump to the height at the withers. Proportionality index relates the body height to the body length and denotes the shape of the animal. Relative depth of thorax index indicates a relationship between the depth of the chest and the length of the legs and relative thickness of cannon bone index shows the relationship between the cannon bone perimeter and the height of the animal. Zoometry provides relevant information to guide and enhance productive performance of domestic ruminants.

**Keywords:** cattle, sheep and goats, functional indices, morphometry, productive aptitude

Volume 5 Issue 3 - 2017

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**Received:** April 04, 2017 | **Published:** April 24, 2017

**Abbreviations:** DCI, dactyl-costal index; DTI, dactyl-thoracic index; LPI, longitudinal pelvic index; PRI, proportionality index; RDI, relative depth of thorax index; RTI, relative thickness of cannon bone index; TPI, transversal pelvic index

## Introduction

Zoometry studies the forms of the animals through concrete body measurements to quantify their conformation.<sup>1-3</sup> Moreover, body measurements can be considered as morphologic characters that can provide comprehensive information to understand the productive performance of domestic ruminants.<sup>4,5</sup> Also, body measurements can relate to obtain functional indices that provide useful information to meet the productive capacities of the individuals or their inclination towards certain productive aptitude.<sup>6</sup>

Among the most commonly used functional indices are:

- i. Dactyl-thoracic (DTI)=cannon bone perimeter/chest girth\*100;
- ii. Dactyl-costal (DCI)=cannon bone perimeter/chest width\*100,
- iii. Relative depth of thorax (RDI)=chest depth/withers height\*100;
- iv. Transversal pelvic (TPI)=rump width/withers height\*100;
- v. Longitudinal pelvic (LPI)=rump length/withers height\*100;
- vi. Relative thickness of cannon bone (RTI)=cannon bone perimeter/withers height\*100 and
- vii. Proportionality (PRI)=withers height/body length\*100.<sup>6,7</sup>

DTI and DCI are related with dairy aptitude. Both indicate the format of the shape of the animal and establish a relationship between the pectoral mass and the limbs. DTI provides an idea of the degree of fineness of the skeleton, classifying the animals as hypermetric (large format), eumetric (medium format), orelipometric (small format), being less than 10 in animals with dairy phenotype and greater than 11 in those with meat phenotype.<sup>6,7</sup>

TPI and LPI serve to estimate the meat aptitude of the animal, relating respectively the width and length of the rump to the height at the withers. A TPI largely exceeding 33 and a LPI not exceeding 37 are suitable indicators for meat animals.<sup>6</sup> PRI relates the body height to the body length and denotes the shape of the animal. A value less than 100 (predominance of the body length on body height) indicates that body tends to be rectangular, characteristic of meat breeds, whereas a value greater than 100 indicates that the form of the animal tends to be square, characteristic of dairy breeds.<sup>6,7</sup> RDI indicates a relationship between the depth of the chest and the length of the legs. A value greater than 50 is usual in short-legged animals with deep chest with tendency towards meat phenotype.<sup>6</sup> RTI shows the relationship between the cannon bone perimeter and the height of the animal, being higher in breeds with meat aptitude.<sup>6</sup>

## Conclusion

Along with other tools such as genetic improvement, the knowledge of the productive aptitude of domestic ruminants through zoometry provides relevant information to guide and enhance their productive performance.

## Acknowledgements

None.

## Conflict of interest

Author declares that there is no conflict of interest.

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