

## CHAPTER 1 INTRODUCTION

### 1.1 Research Background

Goats are ruminants including many cultivated types. The Indonesian people familiar with various types of goats as kacang goat, ettawah goat, boer goat and results cross is with the specifications and characteristics of the different anatomy. Kacang goat for example, a goat is a native goat of Indonesia. Kacang goat discrete small body short, short erect ears, short neck, mean body weight in the male is 25 kg while the female rate of 20 kg. Ettawah goat adult male is 40 kg and the female is 35 kg (Wijoseno et al., 2009). Correlation between body weight to body size results in size are used for several purpose such as estimating weight or age (Alphonsus, 2010, Ebegebulem et al., 2011, Shehu et al., 2012). The sizes can be long, wide or circumferences with the frameworks as a point of orientation.

During weight-bearing activities, the feet are exposed to large forces, particularly when the activity is dynamic, such as walking. The pressure under the plantar surface during walking varies per foot area because of a number of factors related to the normal rollover during the stance phase of gait (Deursen, 2004).

It is well established that mechanical loading is important to homeostasis of cartilage tissue, and growing evidence suggests that it influences cartilage differentiation as well. Whereas the effect of mechanical forces on chondrocyte biosynthesis and gene expression has been vigorously investigated. the effect of the mechanical environment on chondrocyte differentiation has received little attention (Elder, 2000).

Skeleton composed of many vertebrae are broadly grouped into the axial skeleton, forming the axis of the body and appendices of the group of bones that form the skeleton of the limbs. Primarily skeletal framework limb function in addition to having to give-up the body, the body has the role of supporting the load. Relative to the bone growth is affected by several factors such as genetic factors, hormonal factors and the environmental factors such as expenses incurred (Rauch, 2005). Judging from the structure, including the unguligrada goat, which is a group of animals that use the toe (phalanx) as the main load-bearing components of the body (Michilnsens et al, 2009). Unlike human, ruminants including goats on the third and fourth toes only grow and shape are similar. But because of the complex factors such as genitis environmental causes body weight to the fingers spread unevenly (Rauch, 2005). Moreover compared to forelimb, the load received by hindlimb are not as heavy as the forelimb.

On the basis of the understanding of the research conducted to determine the possibility there are differences in some variables of *Os digiti* of proximal phalanx of the left hindlimb.

## 1.2 Identification of Problem

Based on the background above, the problem can be formulated in this study is whether position of proximal phalanx of left hindlimb of goat can be identified based on morphometric *Os digiti* ?

### 1.3 Theoretical Basis

While bone growth in length – and thereby growth in body height – has been one of the key preoccupations of pediatric medicine for a long time, bone growth in width has received much less attention, even though it is of paramount importance for skeletal development. It is clear that if bones just grew in length without increasing in width, they would become unstable and break at some point (Rauch, 2005).

The reason for this intuitively obvious relationship between bone length, width and strength is that the bending strength of an elongated structure such as a long bone diaphysis is related to its diameter raised to the third power. If two solid rods have the same length but one rod is twice as wide as the other, the wider rod will be eight times stronger. In contrast, bending strength is *inversely* related to length raised to the third power. If two solid rods have the same width, but one is twice as long as the other, the longer rod will be just one eighth as strong. Thus, bone growth in length and growth in width have exactly opposite effects on bone strength. As bone width is one of the most important determinants of bone strength throughout life (Rauch, 2005).

### 1.4 The Aim of Research

This study aimed to identify the position of proximal phalanx of left hindlimb of goat based on morphometric *Os digiti*.

### 1.5 Outcome of Research

The outcome of this research is we can determine the position of proximal phalanx of left hindlimb of goat by observing morphometric *Os digiti*.

### 1.6 Hypotheses

Identifying the positions of proximal phalanx of left hindlimb of goat can be determined by the morphometric *Os digiti* indicates that there is a difference in size between the abaxial side and the axial side of digiti III and digiti IV.

