

## Effect of different temperatures on body weight gain in chinchillas

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**Article Details:** Received: 2016-05-27 | Accepted: 2016-06-15 | Available online: 2016-09-01

<http://dx.doi.org/10.15414/afz.2016.19.si.52-54>

The aim of this study was to analyze the differences in body weight gain in dependence on temperature. Animals were divided into 2 groups by the temperatures. The 1st group was kept in temperature 17 °C and 2nd group was kept in temperature 24 °C. To calculate basis statistic characteristics, to determine significance of differences and to compare results t-test were performed at  $P < 0.05$  level. The highest body weight gain of chinchillas was found in group of animal, which were breed in conditions with highest temperature (24 °C). In this group body weight was 0.4972 kg in average. The effect of different temperature on body weight gain was significant in male chinchillas.

**Keywords:** body weight gain, chinchilla, temperature

### 1 Introduction

In fur animals especially important is the size of the skin, which is a determinant of its value. In studies carried out by different authors at finn racoons, foxes and mink shown that there is a positive correlation between the body weight and the size of the skin of animals (Gugolek et al., 2002).

Body weight of one day chinchilla puppies should be achieve from 24 to 64 grams after birth, in 30 day of life we should weighted about 100 g, ending the second month of life occur rearing of puppies cubs and in this time we should achieve a minimum of 240 g and in third month should by live weight on minimal value of 360 g (Konrád, 1996).

Leon (1986) and Young (1985) reported that thermoregulatory mechanisms are susceptible to modification by early postnatal experience. The room temperature should not be less than 17 °C and humidity should not be higher than 60 %. In the natural environment, the humidity often decreases to 30 %. Also, high temperature can be dangerous. Temperature should be a maximum to 26 °C, higher temperatures cause heat stress in chinchilla and temperature above 30 °C may be fatal for him (Barabasz, 2001). Animals reared at lower environmental temperatures exhibit improved defense on subsequent exposure to cold than those reared at higher temperatures (Hahn, 1956; Cooper et al., 1980; Jensen et al., 1980). Conversely, animals reared at elevated temperatures are more tolerant of exposure to heat than those reared at lower temperatures (Ingram, 1977, Heath and Ingram, 1983). Young and Yasunobu (1998) presents that rats reared in cool environments are more tolerant of cold as adults, whereas those reared in warm conditions are more tolerant of heat.

The aim of this study was to analyze the differences in body weight gain in dependence on temperature.

### 2 Material and methods

#### 2.1 Analyzed material

The experiment was carried out on 20 puppies of chinchilla. All animals were kept in cages and feeding by feed mixture by method of Thiedeová (2007). Feed mixture contains 200 g shredded wheat germ, 80 g shredded barley, 120 g oats, 70 g oatmeal, 30 – 40 g millet, 50 – 60 g peas, 50 g soya,

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20 g meadow seeds, 100 g wheat bran, 15–20 g malt culms, 10–15 g dried yeast, 10 g sunflower seed, 20 g dried skimmed cow's milk, 5 g table salt. These animals were divided into 2 groups in dependence on temperature.

## 2.2 Methods

The data used for statistical analyses represent means of value from 10 animals from each group. The first group consists of 6 male and 4 female keeping in temperature 17 °C and second group was formed by 7 male and 3 female in temperature 24 °C. Chinchilla puppies were weighted from day 1 to 10 months. From day 1 to day 61 chinchilla puppies were weighted in two days intervals. Following weights were realised in month's intervals from second month to tenths month. To weight of chinchillas was used digital scale with readability of 0.01 grams. To calculate basis statistic characteristics, to determine significance of differences and to compare results t-test were performed at  $P < 0.05$  level. The packed SAS 9.3 of SAS Enterprise Guide 5.1 was used (SAS Inc., New York City, USA, 2009).

## 3 Results and discussion

The mean body weight of one day chinchilla puppies was 47.96 g (48.17 for male and 47.75 for female). Chinchilla puppies were divided into 2 groups. The first group was kept in temperature 17 °C and second group was kept in temperature 24 °C. The effect of different temperatures on body weight of chinchillas was tested. Results of the effect of temperature on body weight gain in tenth month are shown in table 1.

Table 1 Body weight gain of chinchillas in tenth month ( $\bar{x} \pm s. d.$ )

Group	Body weight gain (kg)		
	Male	Female	Total
G1	0.4733 $\pm$ 10.05	0.4728 $\pm$ 9.81	0.4731 $\pm$ 9.39
G2	0.5004 $\pm$ 13.07a	0.4897 $\pm$ 27.59	0.4972 $\pm$ 17.61a
	$P \geq 0.0015$	$P \geq 0.2971$	$P \geq 0.0019$

The highest ( $P > 0.05$ ) body weight gain of chinchillas was found in group of animal, which were keeping in conditions with highest temperature (24 °C). In this group body weight was 0.4972 kg in average. The effect of different temperature on body weight gain was significant in male chinchillas. The male chinchillas, which were keeping in conditions with highest temperature, have got significant highest body weight gain (0.5004 kg) in comparison to the male chinchillas which were placed in conditions with lower temperature (17 °C). These male chinchillas body weight gain was 0.4733 kg in average.

Dzierżanowska-Góryń et al. (2014) presents that the mean body weight for all litters of chinchilla puppies at birth was 0.0495 kg. The highest average body weight one day chinchilla had a chinchilla from individual litters, and the lowest mass characterized by quadruplets. Males are heavier females from the first month of life, but to the age 4 months the differences are not statistically significant.

In most studies examine sexual size dimorphism among mammals, males are larger than females. This generalization tends to hold in Rodentia, where most species are relatively small, and sexual dimorphism, if it exists, tends to be male dominant (males larger than females) (Ralls, 1977). These claims are in agreement with our results.

Rabbit producers are interested in the relationship that exists between bodyweight and physical characteristics, since this information would reflect in their feed efficiency and performance of the rabbits (Gracis, 2008).

## 4 Conclusions

Different temperatures of environment have effect on body weight in chinchillas. The highest body weight gain of chinchillas was proved in group of animal, which were keeping in conditions with higher temperature (24°C). Breeders need to establish the relationship that exists between these parameters and to organize the breeding programmes so as to achieve an optimum combination of bodyweight and good conformation for maximum economic returns.

## Acknowledgments

This study was supported by the Slovak Research and Development Agency (Contract No. APVV-14-0054 and APVV-0636-11).

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