

# THE EFFECTS OF HIGH ENVIRONMENTAL TEMPERATURES AND NIGHT FEEDING ON PERFORMANCE OF DAIRY COWS

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## Abstract

The objectives included in this title were studied in two trials.

In **Trial 1**, *Dry Matter Intake* (DMI) was determined in two groups of cows (3 animals in each group) in which one had free access to water and food (pasture) during 24 hours of day. The second group was kept indoors between the afternoon and morning milkings without food and water.

DMI of cows at pasture was determined by the use of Cr<sub>2</sub>O<sub>3</sub> as a marker following the technique proposed by Le Du and Penning (1982).

Cows with free access to food during 24 hours of the day had a DMI of 12.8 kg/day.

In **Trial 2** the animals were treated the same way as trial 1 (with or without food at night). In this trial cows were not only on pasture. All animals received 4kg of concentrate per day. Milk yield of the two groups of cows (8 per group) was recorded.

Cows with free access to food during the 24 hours of the day produced 20.9 kg of milk per day. The ones without food at night produced 17.6 kg of milk per day. Differences were significantly different ( $p < 0.01$ ).

During the period in which these trials took place the average maximum and minimum temperature were 31.5 and 14 °C respectively.

## Introduction

Heat stress may limit performance of homeothermic animals, since these need to avoid generation of heat and optimize the ways of losing it, in order to keep constant body temperature.

Food intake increases heat production by the animal and as such is normally depressed in hot environments. Milk yield is also reduced as a result of lower synthetic activity and depression of food intake.

Considering the above mentioned aspects two experiments were designed to confirm the effects of high temperatures (summer days in the centre of Portugal) on dry matter intake (DMI) and milk yield of dairy cows.

Allowing animals to graze at night, when environmental temperatures are lower was also studied as a solution to alleviate the effects of heat during the day.

## Materials and methods

The objectives mentioned before were achieved in two trials.

### Trial 1

In this experiment DMI of dry cows was determined.

DMI of grazing animals was predicted by the technique proposed by Le Du and Penning (1982), which is based on faecal elimination and carried out with indigestible markers (Cr<sub>2</sub>O<sub>3</sub>).

Six dry adult dairy cows were allocated to two groups according to their liveweight. Group 1 was kept on pasture 24 hours a day. Group 2 only grazed during the day since animals were kept indoors between evening and morning milkings (these animals were grouped with lactating cows) without access to food.

Both groups received 600 g per day of concentrate (91.9 % of ground maize, 3.6 % of molasses, 1.4 % of Bentonite and 3.1 % of Cr<sub>2</sub>O<sub>3</sub>) to carry the indigestible marker.

Daily records of environmental temperatures were kept (maximum and minimum values)

Water was available for all animals all the time.