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Case Report

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Effects of non-conventional feed (*pittosporum undulatum*) in bovine progesterone levels

Abstract

There are several advantages of using non-conventional feed in animal production, reducing the cost of food by using locally available resources. *Hedychium gardnerianum* and *Pittosporum undulatum* are invasive plants all over the world, being in the Azores supplied to livestock during periods of lack of food. As these plants produce secondary metabolites, including a diverse assortment of phytochemicals, with this study we understand that excess the consumption of *Pittosporum undulatum* affects negatively bovine reproductive performance.

Keywords: *pittosporum undulatum*, bovine, reproductive performance, non-conventional forages, ruminants

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Nunes H, A Borba, F Moreira da Silva
Agricultural Science Department, University of the Azores, Portugal

Correspondence: Nunes H, Agricultural Science Department, University of the Azores, ITTA, Rua Capitão João d'Ávila, 9700-042 Angra do Heroismo, Portugal, Email helder.pb.nones@uac.pt

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Introduction

Animal production in the Azores is conditioned by the cycles of grass production and are observed two periods of lack of grass are observed in the year: in the summer (namely August and September) and in the winter (November, December, January and February) in the high islands or in the high zones of all the islands.[1] In these periods are used different non-conventional forages to feed animals during long term of grass shortage. The use of non-conventional forages has been studied in several parts of the world, as a mean to combat desertification,[2] and for increase the nutritional value and composition of this plants,[3] yet there are very few studies that mention the physiological consequences of using these plants in ruminants. The utilization the resources non-conventional feed as trees or shrubs can negatively affect animal productivity because they contain secondary compounds. Some these compounds have been reported to interfere with the palatability of food on the bioavailability of other nutrients as antagonists. When present in high concentrations these compounds can be toxic to the animal's metabolism, affecting the nervous, immune, endocrine and reproduction systems.[4,5] In extreme cases if can cause death of animals.[6] In Azorean islands the plants non-conventional with greater relevance are *Pittosporum undulatum* Vent. (Incense) and *Hedychium gardnerianum* Sheppard ex Ker-Gawl. (Conteira). *Pittosporum undulatum* is native to south-east Australia[7] and is a 5-15 m tall temperate climate tree that belongs to the *Pittosporaceae* family and features white flowers and lanceolate acute, glabrous leaves.[8] *Hedychium gardnerianum* Ker-Gawl is a rhizomatous (tuberous root) herbaceous perennial of the family *Zingiberaceae,* native to the Himalayas.[9,10] This plant can reach 2 m in height and features oblong, 30 cm long leaves and numerous aromatic red-orange flowers, with inflorescences of 20-30 cm height.[11] Both plants were introduced in various countries, for ornamental purposes or, in case of Pittosporum undulatum,[12] to protect crops against wind. These plants are easily adaptable to many different media invaded native habitats.[11–13] The utilization the non-conventional forages in periods grass shortage its common. Although this century old practice has been beneficial for local farmers, some believe that after prolonged ingestion of *Pittosporum undulatum* and *Hedychium gardnerianum* a progressive decline in cattle reproductive performance occurs, specifically in prolonged temporary anoestrus, silent estrus, while further evidences shows an increase in early embryonic mortality or even abortions.[14] In view of the empirical observations made by cow producers it was necessary to prove scientifically whether there was any link between the feeding of unconventional fodder and reproduction. Thus, this study aimed to analyze progesterone levels throughout pregnancy as well as to confirm pregnancy through rectal palpation.

Experimental design

Of the 50 animals analyzed, 25 animals belonged to the experimental group (they ate daily *Pittosporum undulatum*); Remaining 25 belonged to the control group (they never ate *Pittosporum undulatum*). All blood samples were collected for later determination of progesterone levels. The animals of both groups were divided into three classes of 0-3 months 3-6 months and 6-9 months according to time of gestation elapsed. Pregnancy diagnosis was performed by rectal palpation.

Results (preliminary)

In a study carried out for us on the island of São Jorge, we intended to determine the progesterone levels in blood during pregnancy in animals whose diet contained mainly Pittosporum undulatum. It has been observed that 31.6% of cows recommended by farmers to collect blood for a pregnancy diagnosis test were in fact not pregnant after rectal palpation. However, the farmers thought that these cattle were pregnant, because in the last six weeks they did not show any signs of estrus. Data showed also that during pregnancy the plasmatic progesterone average levels in the animals fed with *Pittosporum undulatum* were always lower (14.20±1.7ng/ml) than the values found in the control group (20.72±2.8ng/ml), in which this plant was not provided to animals. Thus, we can conclude that the use of large amounts of *Pittosporum undulatum* in feeding dairy cattle may affect the reproductive performance of these animals.

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None

Conflict of interest

The author declares that there is no conflict of interest.

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