

「 CASE REPORT 」

## Oculocutaneous albinism in a calf in Korea

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### Abstract

Albinism, characterized by absence or lack of pigmentation from the hair, skin, hooves, nasal region and the eyes is rarely seen in cattle in Korea. A 15-day old calf, approximately weighing 28 kg has been conspicuously distinct from the rest of 40 herds of cattle raised in Sunchang country because of its white coat color, white muzzle and hooves and eyes with light pinkish iris. The calf was born of Korean indigenous cattle with no previously reported history of albinism since inception of the farm for over a decade period. It was assumed as a form of recessive genetic disorder. This observation was documented to present occurrence of albinism in cattle in Korea.

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Key words: Aalbino, Albinism, Calf, Oculocutaneous, Korean indigenous cattle

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### Introduction

Albinism involves a broad range of disorders that result in problems of pigment synthesis and distribution. Various enzymes produce melanin pigment, in mammals, the most important enzyme is

tyrosinase, which is produced by the gene C-tyrosinase and its mutations called the C allelic series<sup>1, 2)</sup>. Tyrosinase is the first enzyme in melanin synthesis pathway converting tyrosine to dihydroxyphenylalanine (DOPA) and then to dopaquinone<sup>3)</sup>. The most common disorder of pigment synthesis is the classic or complete albinism, the oculocutaneous form, which is a

tyrosinase negative true albinism caused by different mutations in the different regions of the tyrosinase gene<sup>4)</sup>. Tyrosinase mutations have been characterized in cattle<sup>5)</sup>. Albino cattle are at potential risk of actinic-induced skin and eye disorders due to reduced or absence of protective melanin pigments that normally block or filter out excessive ultraviolet radiation from sunlight. This report documented observation of albinism in cattle in Korea.

## Symptoms

A calf in Sunchang county upon birth was apparently healthy showing no signs of abnormalities except the unusually distinct white color. The calf was observably noticed with reluctance to visualize under bright light. Closer examination of the eye showed absence of usual retinal brown pigment. The color of the iris appeared light pink. This was the first albino calf over a ten-year period of farm operation. Photographs were done to document the case. Fig 1 and Fig 2 show the condition of the calf, its coat and eye color.

## Discussion

Albinism is a genetic disorder that is characterized by diminished ocular and most often absence of cutaneous pigmentation. Disorders are generally subclassified as oculocutaneous albinism or ocular albinism based on the extent of their effects on the pigmentation of the skin and hair<sup>6)</sup>. The various albino mutations may act in different ways and may occur at several different loci or genetic hetero-

geneity, but the end result is always a defect in amount of pigment production and distribution. Various enzymes produce melanin pigment, but in mammals the most important enzyme among them is tyrosinase, which is produced by the gene C-tyrosinase and its mutations<sup>7-10)</sup>. Incomplete albinism was likewise reported in cattle<sup>11)</sup>.

The prevalence of albinism in cattle is not yet established elsewhere. Prevalence rate in this case can be estimated by predictive prevalence method from available data of 40 mature cattle operating over a ten-year period. However, since most of the cattle are bred by artificial insemination method, prevalence of albinism may be difficult to calculate between those raised in artificial and natural mating methods. Although rarely or occasionally seen, this condition must be attended with caution as albino individuals readily suffer from actinic irradiation and ocular impairment since the protective melanin that serves to filter out ultraviolet radiations are absent in these animals.

Although considered a genetic disease, familial pattern may be difficult to trace since this single case only recently emerged after a ten-year period of farm operation. The genetic patterns and the microscopic appearances of complete albinism have already been reported<sup>4,6,8,11)</sup>. Since both parents and even from initial stock grandparents were of normal coat coloration, it is therefore assumed that this albinism is a recessive type, as are most forms of albinism in most species. A recessive form of albinism was already reported in Brown Swiss or Braunvieh

cattle as early as 1934 at a very low frequency<sup>2,4)</sup>.

Based on the available references, this case was impressed as a form of oculocutaneous albinism or complete albinism since both the integument and the eyes are affected<sup>4,5)</sup>. Fortunately, this calf has

been protected from potential risks of excessive sun exposure-induced problems since it has been confined inside a galvanized roof-shaded farmhouse together with the rest of the cattle. This case documented the rare occurrence of albinism in Korean indigenous cattle.

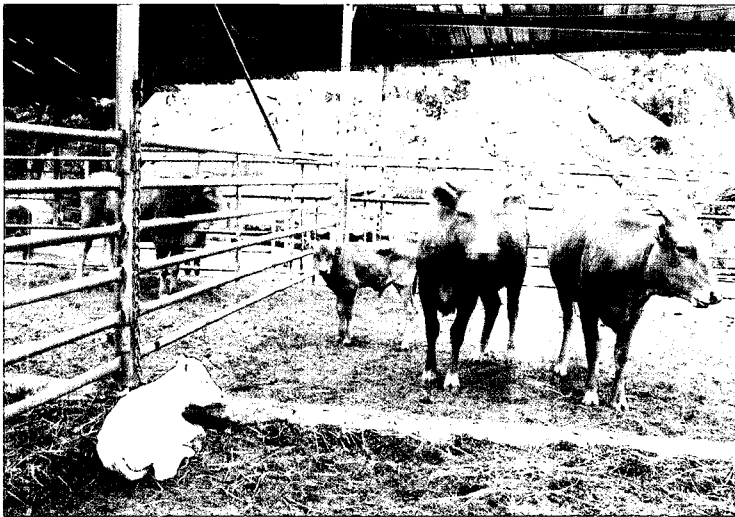


Fig 1. The calf showing conspicuously distinct color from other cattle and calf. Animals were kept in shaded roof in the farm



Fig 2. The calf showing integumentary and ocular involvement (2a). Closer view of the eye (2b). The calf apparently avoiding the light (2c). Note the lighter appearance of the muzzle, hooves and the pink color of the iris of the eye

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