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## The Case Report of Taillessness in Iranian Female Calf (A Congenital Abnormality)

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**Abstract:** The aim of this study, is case report of taillessness abnormality in Iranian calves. Taillessness syndrome can be a lethal attribute in animals. In a village in the suburbs of Tabriz, a Northwestern city in Iran, a tailless calf was born. During the examinations and observations, no problem in digestion and faeces excretion was noticed and the calf had a normal growth. There was a small excrescence on the back of the calf where the tail grows. In this recent case, there was no rectal adhesion. The aforementioned calf was born through the Artificial Insemination (AI) of a native female cow with a Holstein bull. The cow is completely healthy and in her previous parturitions, it has given birth to several healthy calves. Comparing this case with the other reported abnormalities reveals that this anomaly is rare and the probability of its occurrence in female calves of dairy cattle is twice the probability of occurrence in male calves. Most scientific reports have shown that tail abnormalities occur when a native cattle is inseminated with a pure breed cattle such as Holstein. Future study about genetical reasons of Taillessness in native calves may help to solving of this problem, especially in Iranian hybrid (Holstein-native) cattle.

**Key words:** Congenital abnormalities, taillessness, rat-tail syndrome, calf

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### INTRODUCTION

Congenital anomalies occur in one or more systems characterised by structural and functional abnormalities of the related system. Congenital defects result from either genetic factors or environmental agents. Mutant genes or chromosomal disturbances cause hereditary defects (Blowey and Weaver, 1997). Besides, nutritional factors, toxins and drugs can also cause Congenital Abnormalities (CA) (Blowey and Weaver, 1997; Hidioglou *et al.*, 1990). The structural and functional abnormalities that are distinguishable at birth or the time when the fetus leaves the fetal chorion are scarce. In cattle, sheep and pigs, the number of CA usually ranges from 2 in 1000 births to 3 in 100 births (Blowey and Weaver, 1997; Dennis, 1997).

Distl and Bähr (2005) reported in a survey that the occurrence rate of CA among cattle in Germany is 0.51%, where all the cattle under study were born through artificial insemination. Leipold *et al.* (1983) declared that from total hereditary defects, 24% is related to skeletal-muscular system, 13% to digestive and respiratory systems, 22% to central nervous system, 9% to ventricular membranes, 4% to urinary system, 3% to cardiovascular system, 2% to skin and 4% is related to the other organs. Taillessness syndrome in animals can create unsuitable condition for cattles. Total or partial lack of tail among cattle (such as Taillessness and Rat-tail syndrome) brings about the followings:

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- The calf is not resistant against bad environmental conditions
- Its sale and marketing includes a lot of hardships
- Total carcass value decreases (Huston and Wearden, 1958; Ayers *et al.*, 1989)

In addition to cats, a kind of hereditary Taillessness syndrome exists among dogs and mice, which is a lethal attribute as well (Hamori, 1995). The entire lack of tail among dairy cattle is a scarce phenomenon and rarely appears in Holstein calves or mixed-bred calves (Huston and Wearden, 1958). Belge *et al.* (2000) reported a statistical data about occurrence of CA in Van Province (Eastern Turkey) that from calves admitted to Van veterinary clinic, 151 of them had CA and only one of them had taillessness disorder. Also reported that, CA in calves is increasing in Turkey, specially in native breed (more than Holstein breed) (Belge *et al.*, 2000).

The other phenomenon regarding tails is called Rat-tail. Rat-tail syndrome is a hereditary phenomenon that causes the calf being born to have a less hairy, curly and malformed tail or at times to have no tail. This incident occurs when native cows are crossed with black bulls and is very rare. The genes causing this syndrome are located in two separate locus and interact with each other (Schalles and Cundiff, 1999). The Rat-tail calf should be homozygous in either of this locus. In 1960s and 1970s when native cattle were crossed with Holstein or Angus cattle in the United States, Rat-tail syndrome was observed in several cases (Schalles and Cundiff, 1999). Ayers *et al.* (1989) noted that tail abnormality affects the efficiency and health of the calf. Also, Rat-tail calves gain less weight during winter in comparison with normal calves due to the fact that they consume a big deal of their energy to maintain their body temperature (Ayers *et al.*, 1989). This phenomenon (Rat-tail) does not exist among pure breeds and only emerges in crossbred cattle (Schalles and Cundiff, 1999). In Longhorn cattle in Texas, America, a similar phenomenon is also noticed that is called Reduced-switch syndrome. In this case, the calf's tail is roughly half the size of a normal tail and contrary to Rat-tail syndrome- the gene controlling this syndrome is totally a recessive gene (Hillis, 1997). In a survey carried out by Schalles and Cundiff (1999) (about Rat-tail syndrome), it was revealed that this recent syndrome does not appear in black cattle being mixed with black or dark red being mixed with dark red. The red cattle do not have the second gene required for Rat-tail syndrome to happen (Schalles and Cundiff, 1999). This present scientific report concerns the birth of a tailless calf in Iran.

## CASE HISTORY

This tailless calf was born in a village in the suburbs of Tabriz, in the Northwestern Iran (at 3/6/2008). The information regarding the birth of this abnormal calf was gained through a report sent to the Agriculture Department of this region. This crossbred calf was born as a result of Artificial Insemination (AI) of a native cow with a Holstein bull.

### Characteristics of the Calf

Its color is brown with white spots on its forehead and back where the tail grows. It entirely lacks the tail; however, it's completely healthy from other physical points. Its gender is female and was 47 days old while the photographs were taken (Fig. 1). According to the examinations and observations, the calf has no problem in digestion and faeces excretion. The interesting point is that there is a small excrescence on the back of the calf where the tail grows which can be regarded as the remnant sign of the unformed tail. This excrescence is 14 cm upper than the natural position of the tail (Fig. 2). Its faeces and urine are excreted normally, without any problems (Fig. 3). Considering its age, it has a suitable growth and is nourished by the milk of the mother cattle.



Fig. 1: The tailless female calf



Fig. 2: A small excrecence on the back of the calf where the tail grows (14 cm way from the normal position of the tail)

#### **Maternal Characteristics**

The mother cattle is a native cattle of this region and has a dark brown color. It's thoroughly healthy and has no record of any serious diseases. This calf is the result of the mother cattle's fifth parturition. The other calves born by this cow- brothers and sisters of this calf- were all healthy and had no CA. Since, the calf is the result of an artificial insemination, there wasn't any information about the paternal bull, the father of the calf. However, according to the declarations and brochures of the



Fig. 3: Faeces and urine excretion is done naturally and no rectal atresia exists

Dairy Cattle Insemination Centre of the region, we realized that the father bull was black and of the Holstein breed. It's worth mentioning that the local information reveals that there was a similar birth of a tailless female calf in this village several years ago.

### RESULTS AND DISCUSSION

So far, there have been few reports regarding congenital tail abnormalities in calves, most of which have been related to Europe and the United States (Ayers *et al.*, 1989; Belge *et al.*, 2000). Taillessness, a rare congenital defect of cattle, has been observed in 25 animals sired by registered bulls of the Angus, Ayrshire, Guernsey, Hereford, Holstein, Jersey, Milking Shorthorn and Shorthorn breeds. The occurrence rate of taillessness phenomenon in female calves is approximately twice more than that of the male calves and in 3000 to 205000 births one tailless calf is born (Huston and Wearden, 1958). In most scientific studies about cattle, Rat-tail and Reduced-switch syndrome have been reported, in which the tail has been either short-the case of Brachyury- or away from its normal position (Huston and Wearden, 1958; Ayers *et al.*, 1989) and Belge *et al.* (2000) reported, just one case of Taillessness, without description clearly.

However, the case reported in this study reflects the entire lack of tail. Contrary to most tail abnormalities in which the lack of tail is accompanied by rectal adhesion and excretion difficulties (Huston and Wearden, 1958), in this recent case, no rectal abnormality was noted. In scientific sources, twisted tail is imputed to a homozygous autosomal recessive gene (Distl and Bähr, 2005). Rat-tail syndrome is one of the cases of tail anomaly among cattle in which the resulted hybrid totally lacks the tail resembling this recent case. Rat-tail syndrome emerges in the process of improving native cattle and artificial insemination (Schalles and Cundiff, 1999). Also, Belge *et al.* (2000) offered that CA (include Taillessness) is in increasing with unsuitable artificial insemination in Eastern Turkey.

In nearly all cases of congenital abnormalities mentioned in this study, most tail defects among domestic animals, especially in cattle, have genetic origins (Ayers *et al.*, 1989; Schalles and Cundiff, 1999; Belge *et al.*, 2000) and these abnormalities mostly appear in the process of crossing different breeds (Hillis, 1997; Distl and Bähr, 2005). Recent surveys and information show that inappropriate choice of male cattle for sperm collection, utilization of unsuitable ways in breeding and artificial insemination centers of the region and not omitting the cattle carrying inapt genetic characteristics, causes the propagation of CA in the region (Ayers *et al.*, 1989; Schalles and Cundiff, 1999; Distl and Bähr, 2005). It's being suggested that according to Belge *et al.* (2000), one autosomal recessive gen may cause of this case report.

In order to study and prevent CA in cattles, all the abnormality cases should be recorded in veterinary medicine organization and related associations, the cattle carrying the gene causing the abnormality should be identified and special heed should be taken while selecting the male cattle to

provide the sperm in artificial insemination. Future study about genetical reasons of Taillessness in native calves may help to solving of this problem, specially in Iranian hybrid (holstein-native) cattle.

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