



Comparative Histological Study of Teat in Jenubi Cow and Her Crossbreed

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Abstract

For histological comparative study of the teat, Samples of about 1 cm³ were collected from different parts of teat immediately after slaughter of Jenubi cow and her Friesians crossbreed in Misan government. There are histological similarities in the main structures of the teat found between them. The epithelium of teat canal is thicker in teat of crossbreed cow than the epithelium of teat canal of Jenubi cow. Furstenberg's Rosette, is composed of about 10-12 of folds of double layered epithelium in a rose flower like pattern, while in the teat of crossbreed cow the numbers of the fold decrease to about 7-9 folds. Epithelium thickness of teat canal is particularly increased for Holsteins Crossbreed cow compared with Jenubi cow.

Keywords: *Histology, Teat, Jenubi Cow.*

Introduction

Main location of Jenubi cow is the South eastern and central Iraq. They are unicoloured, usually red (golden to bright bay) or multicoloured, sometimes pied. The Specific visible traits, Zebu, resemble Sahiwal. Milk is the main production and the average of milk yield per lactation 1400 kg, milk fat 4.1% and the lactation length 240 day. Jenubi cows (local cattle) are genetically resistant to endemic diseases and harsh environment. Jenubi cows are occasionally crossed with Friesians to produce 50% cross which is sometimes upgraded to higher level through A.I. using Friesian semen [1].

Although selecting and culling based on conformation of teats and udders may be considered convenience trait selection, selecting against poor teats and udders increases profit potential by increasing calf performance, reducing calf sickness, increasing longevity of the cow and reducing labor inputs[2].

The function of teat canal is to preventing both leakage of milk and entry of bacteria and thereby plays a major role in the defense of the mammary gland against mastitis [3].

Hence, the histological study of teat plays major role in the protection against mastitis in cattle [4]. This is the first histological study in Iraq to comparative histologically between teat of Jenubi cow and her crossbreed.

Materials and Methods

For histological comparative study of the teat, Samples of about 1 cm³ were collected from different parts of teat immediately after slaughter of the Jenubi cow and her Friesians crossbreed in Misan government. The fresh tissue samples were fixed in 10% formaldehyde.

All tissues collected as above were processed by routine Alcohol-Benzene schedule and molded in paraffin blocks for light microscopy [5]. The paraffin blocks of the teat were cut by digital microtome in several serial incisions at 5-7 μ m thickness for histological study. The sections were stained with Haematoxylin and Eosin [6, 7].

Results and Discussion

The teats are membranous tubes of variable length, diameter and wall thickness and

there are histological similarities found in the main structures of the teat of them. From external to internal the teat wall consists of the skin, muscular layer fibrous layer and mucosa. Teat consist from three main parts, from the apex to the base, external teat orifice, teat canal and teat cistern. And these findings in agreement with the suggestion of [8] who said that the bovine mammary gland consists of four quarters, each containing structures called the gland cistern and teat cistern. External teat orifice is located at the apex of the teat. The teat openings are lined by stratified squamous epithelium. The two main parts of the duct system of the teat are the teat cistern and the teat canal.

Teat canal lined by stratified squamous keratinizing epithelium. The epithelium of teat canal is thicker in teat of crossbreed cow than the epithelium of teat canal of Jenubi cow and the amount of keratin, numbers of projections in the rosette and thickness of epithelium is more Fig. (1, 2).Mucosa of teat cistern is lined with stratified cuboidal epithelium appear as numerous longitudinal and circular folds Fig. (3). Thus, teat cistern can hold 15-40 ml of milk [9]. At the distal end of the teat cistern, just above the teat canal, Furstenberg's Rosette is located.

In the text of Jenubi cow , Furstenberg's Rosette ,is composed of about 10-12 of folds of double layered epithelium in a rose flower like pattern, while in the teat of crossbreed cow the numbers of the fold decrease to about 7-9 folds . Fig. (4).In this region, the stratified cuboidal epithelium of the teat cistern changes to stratified squamous epithelium of the teat canal. Furstenberg's Rosette separates the teat cistern from the teat canal. Teat cistern terminating at its distal extremity in the teat canal Fig.(5).

Lamina propria of this region in crossbreed showed more collagen and elastic fibers than in Jenubi cow and there are accessory lactiferous glands were noticed in the stromal tissue of teat cistern. The dermal layer showed bundles of collagen fibers ,smooth muscle and fibroblast cells Fig.(6).The dermal papillae was projects into the epithelial undulations at the dermoepidermal junction Fig.(6). Some authors [10] have reported that the dermis was fibromuscular with large number of blood vessels and nerve fibers, in addition to smooth muscle fibers.

Epidermis layer consists of keratinized stratified squamous epithelium and it was more thickness in Jenubi cow than crossbreed cow. We surveyed the histological parameter of the teat and we found some differences concerning the quantitative parameters representation of individual structural components of the teat. For the epithelial area measurement there was a significant effect of breed, pithelium thickness of teat canal is particularly increased for Holsteins Crossbreed cow compared with Jenubi cow and these may be due to breeding programs to improve milk production and quality, also resulting in lower Somatic Cell Count [11].

It seems likely that Holsteins promotes both increased cellular differentiation as well as increased cell proliferation but confirmation [12]. Moreover, the area occupied by the luminal space (Lumen of teat canal and Lumen of teat cistern) is also particularly increased for Holsteins Crossbreed cow compared with Jenubi cow. Table (1).Our suggestion was agreed with suggestion of [12] who said that effects of breed were significant for the area occupied by stromal tissue.

Table 1: Average values of histological parameter measurements of teat in Jenubi cow and Crossbreed cow

Histological Parameter	Jenubi cow	Crossbreed cow
	Mean	mean
Epithelium thickness of teat canal	5 µm	8 µm
Epithelium thickness of teat cistern	2.5 µm	5 µm
Lumen of teat canal	8 µm	10 µm
Lumen of teat cistern	6 µm	7 µm

Conclusions

The main histological structures of the teat are the same in the Jenubi cow and her Friesians crossbreed and cannot affect by crossbreeding. The breed can affect the epithelium thickness of teat canal which is particularly increased for Friesians

crossbreed cow compared with Jenubi cow and these may be due to breeding programs to improve milk production and quality. These data provide additional evidence to support the idea that crossbreeding of Jenubi cow with Friesians cow can cause difference in histological parameter of the teat.

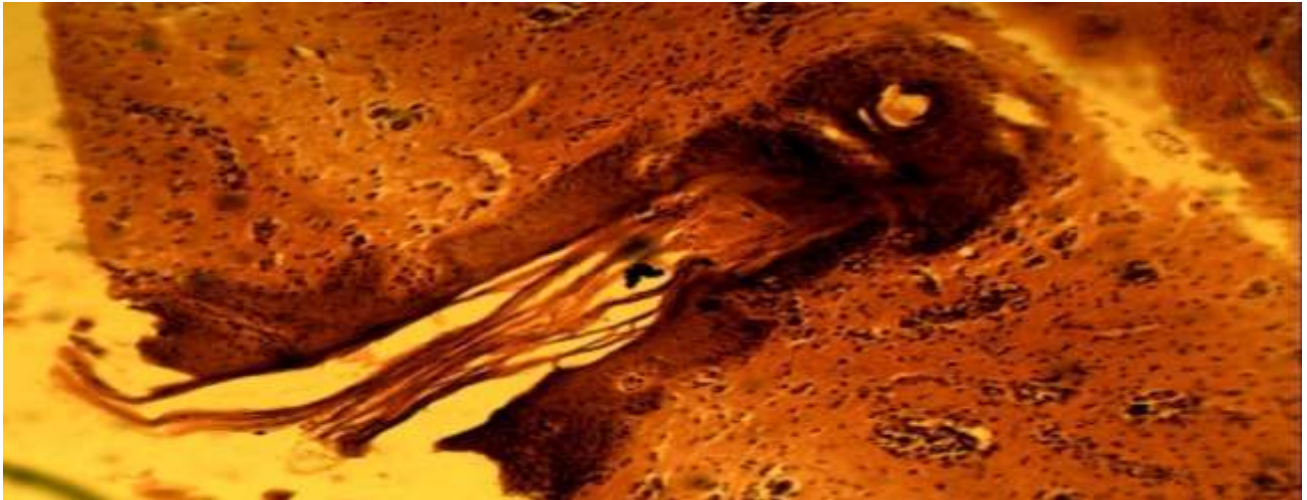


Fig.1: Teat canal of crossbreed 1- stratified squamous epithelium keratinized 2- dermis layer show collagen bundles and fibroblasts. H&E X100

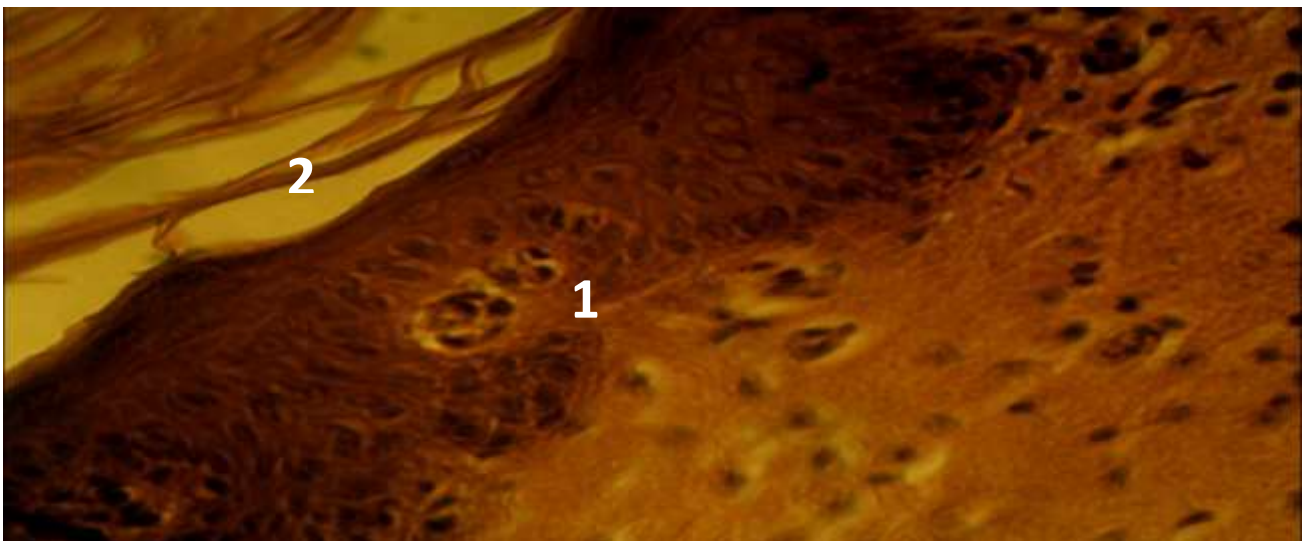


Fig 2: Teat canal of crossbreed cow 1- stratum basal of 1- stratified squamous epithelium keratinized 2-keratin. H&E X400

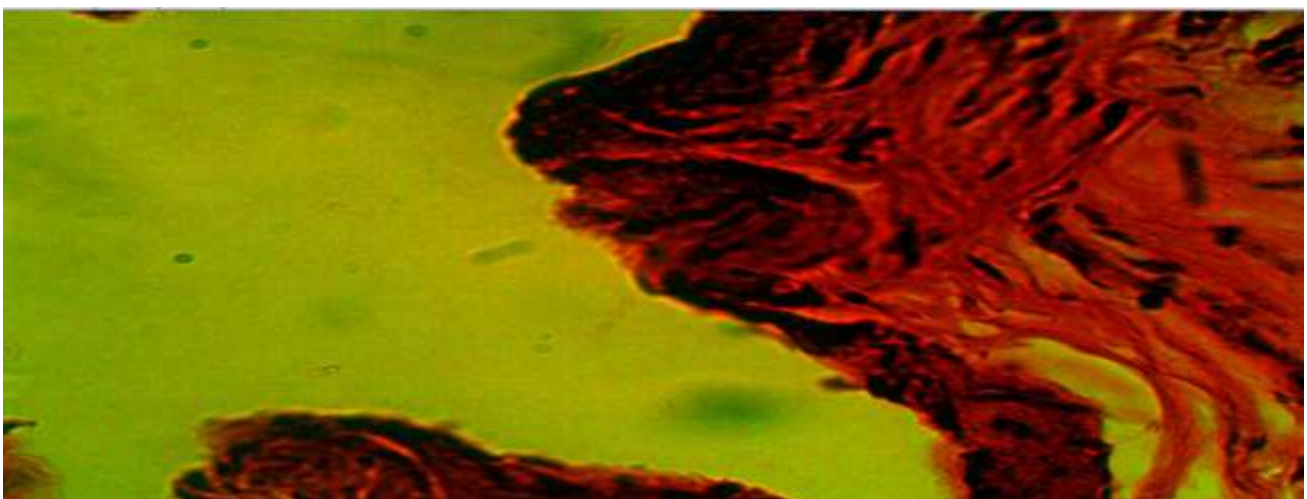


Fig.3: Teat cistern of Jenubi cow show stratified .cuboidal. Epithelium. H&E X400

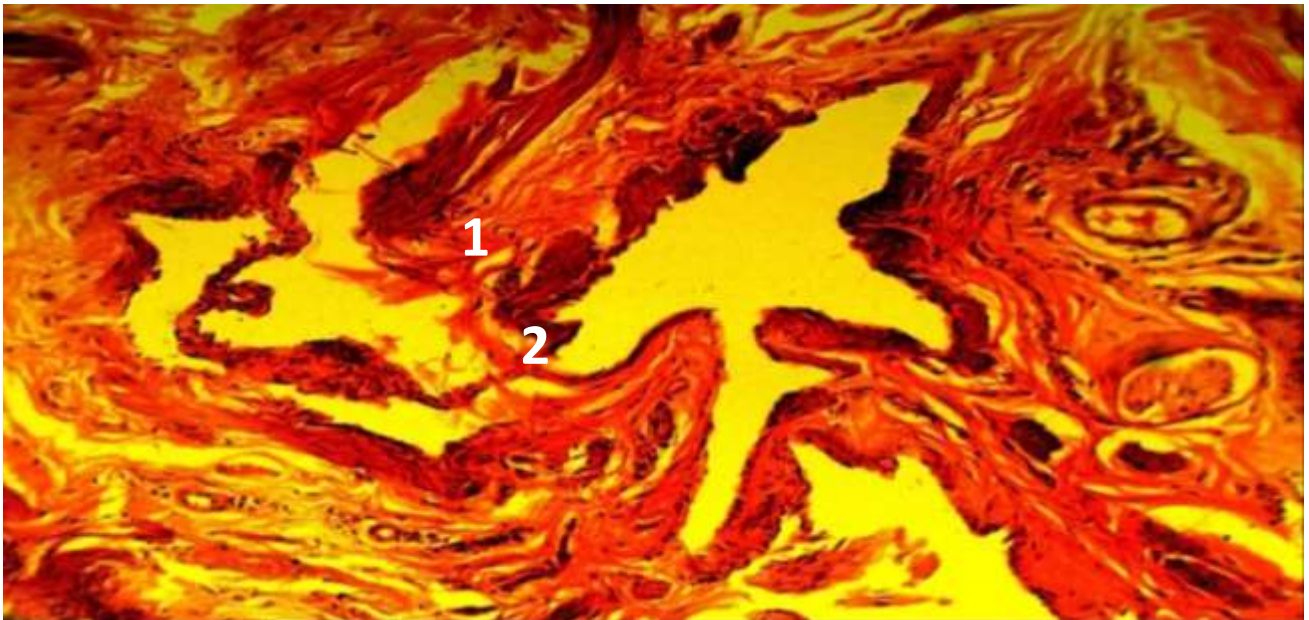


Fig. 4: Teat of Junobi shows Furstenberg's rosette 1-stratified squamous epithelium 2-double layered .cuboidal epithelium. H&E X40

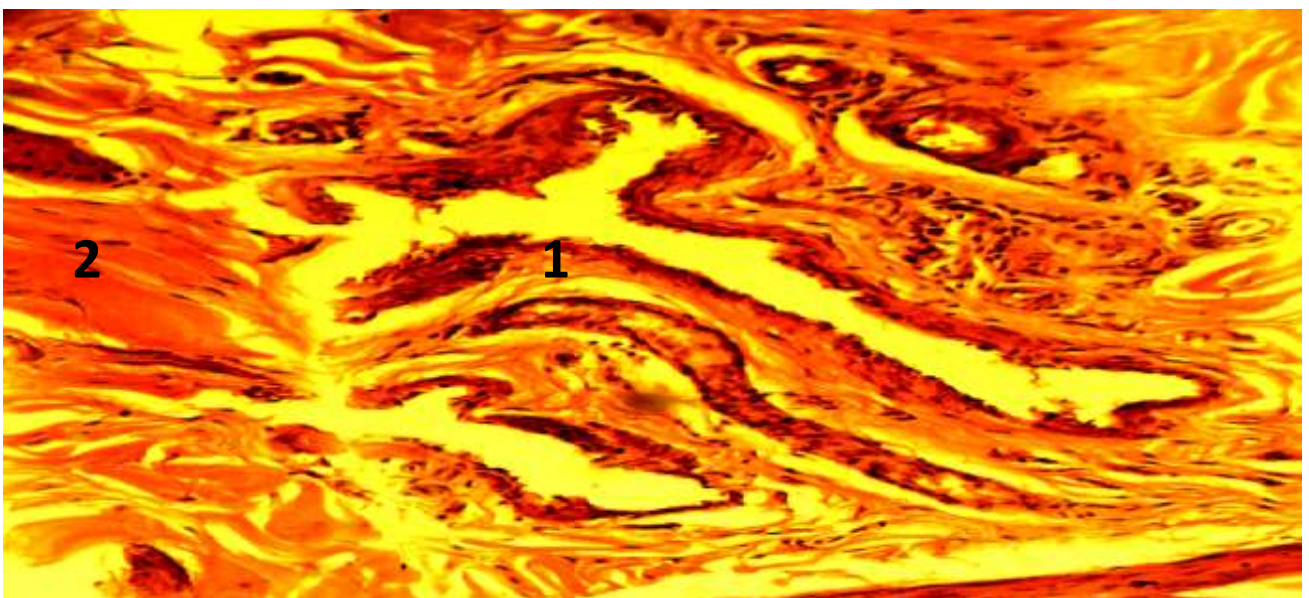


Fig. 5: R.F. Junobi 1-teat cistern stratified cuboidal epithelium2- fibroblast cell H&E X100



Fig.6: Skin of the teat 1-Dermoepidermal junction 2- Epidermis consists of keratinized stratified squamous epithelium H&E X400

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