



## Compare Between Somatic Cell Count ( SCC ) in She Camel and Cow Milk and Genetic Study

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### ABSTRACT

This study was conducted to compare between the somatic cell count ( SCC ) of she camel milk with the SCC in the cow .Fifteen camel milk samples collected from the desert of Iraq and 15 milk samples collected from local Iraqi cows , milk staining by ( Newman Lambert stain ) to microscopical examination of somatic cells (epithelial cells ,and lymphocytes ). The number of SCC in camels ranged between 400 000 cell/ ml to 800 000 cell/ ml in the mean 560 000 cell/ ml , while the SCC in the cows ranged between 480 000 cell / ml to 660 000 cell / ml in the mean 530 000 cell / ml . The staining of milk samples by (ethidium bromide ) to investigation the defect of the SCC by visualized the DNA in the nucleus via florescent microscope , with deferent appearance of the lymphocytes and epithelial cells . The camel and cows milk samples gives a good amount of DNA extraction by phenol chloroform method .In this study concluded, no difference in the range of SCC in camels and cows milk , in addition the milk regarded good source for DNA extraction .

### KEYWORDS

SCC, camel, milk, genetic.

### Introduction

A dromedary camel (*Camelus dromedarius*) is a multipurpose domestic animal that remains central to the subsistence, economic and social livelihoods **1**.

Camel milk has a high vitamin and mineral content and immunoglobulin content **2**. Also the observations and publications that camel milk can cure a number of diseases that have reached epidemic levels **3**. Camel milk is lower in lactose than cow's milk. However, levels of potassium, magnesium, iron, copper, manganese, sodium and zinc are higher than in cow's milk **4**. Cheese from camel milk is more difficult to make than cheese from the milk of other dairy animals **5**. Camel milk lacks two powerful allergens found in cow milk and contains immune system components that might benefit children allergic to milk and other foods **6**. Camel kills neoplastic cells at lower concentrations. The lower effective dose of camel has therapeutic implications as it reduces the probability of side effects that are often encountered during treatment **7**.

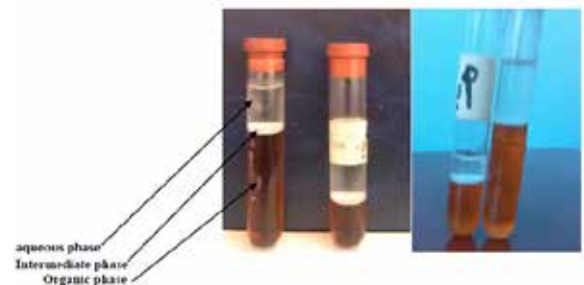
Low-fat camel milk not only contains healthy vitamins and minerals, but also is a rich source of insulin. This milk reportedly has about a quart of insulin in each liter, making it a potential treatment option for diabetics **6**. Therefore this study concentrated on the SCC in the milk with the DNA extraction and differentiate between camel and cow .

### Materials and methods

This study conducted on the camel milk from the desert of Iraq through (april ,may ,june ) month in the spring , schedule with cow milk collection . Milk samples were collected immediately subjected to physical examination of camel milk and stored in the cooled container, subsequently by transmit to the lab of public health in the Baghdad veterinary college, staining the somatic cell by ( Newman Lambert stain ) The somatic cell count (S.C.C.) was done according to standardized cell count methods , An amount of 0.01 ml milk sample was spread over an area of 1 cm<sup>2</sup> on a glass slide. The smear was

dried and heated slowly to prevent cracking and peeling. The smears were stained with Newman's stain for two minutes, washed gently in water **8** . Followed by somatic cell count via microscopical examination . Somatic cell count was measured by using a direct microscopic method with an automatic cell counter **7** . Another samples stained by (Ethidium Bromide Stain ) **9**. The third part of samples submit to total DNA extraction by phenol –chloroform method **Figure 1** . Centrifuga-

tion of milk samples (5 ml , 3000 rpm 10 minutes . The supernatant rid out , white clot precipitate subjected for DNA extraction by phenol –chloroform method , using Proteinase K buffer solution: Consist of (100 mM NaCl , 1mM EDTA , 10 mM Tris-HCl pH 8.0 ) , dissolved in 100 ml distil water , sterilized by autoclaving 15 minute .added 0.5% SDS in 55C°. Stored in refrigerator ( 4 C°) **10**.eventually DNA precipitate by absolute alcohol .



**Figure 1: The separation of DNA and proteins from milk by phenol –chloroform method, the test tubes contain the organic phase , intermediate phase ,and aqueous phase .**

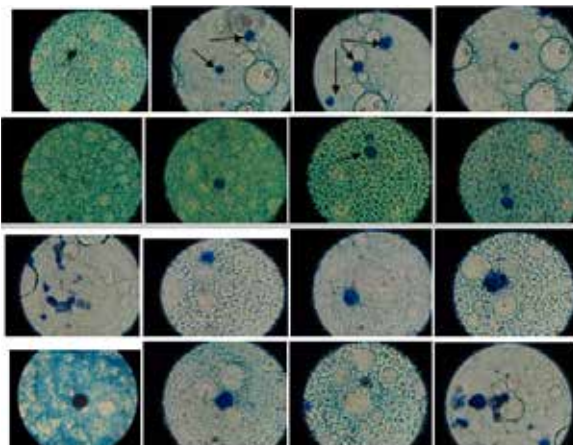
### Results and discussion

A total of fifteen camel milk samples were collected from the Iraqi desert under aseptic conditions , and fifteen cow milk samples were collected from local Iraqi cows . The number of SCC in the fields of microscopical examination **Figure 2** , in the camel ranged between 400 000 cell/ ml to 800 000 cell/ ml in the mean 560 000 cell/ ml , while the SCC in the cow 480 000 cell / ml to 660 000 cell / ml in the mean 530 000 cell / ml **Table 1** .The normal SCC must under 750000 **11** . Somatic cells count (SCC) which is used as diagnostic tool to detect sub-clinical mastitis in camels . Somatic cell counts (SCC) of 2.5×10<sup>5</sup> cell ml<sup>-1</sup> were used as the cut-off point to classify the milk samples as positive in this assay **12**. Therefore, readings above 250,000 cells/ml were considered positive **8** .The total number of herd test days, average number of cows with usable records per herd on test day, average test-day milk yield and herd SCC, and percentages of herd test days that exceeded four levels of SCC (750,000, 600,000, 500,000, and 400,000 cells/mL) for each state (excluding Alaska and Hawaii but including Puerto Rico and Mexico) **13**. European

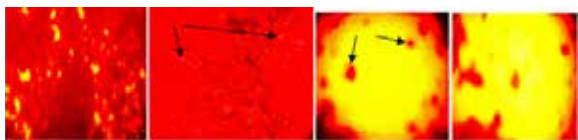
Union, Australia, New Zealand and Switzerland, the somatic cell count shall be not more than 400,000 cells per milliliter, it is 750,000 in the USA and 1,000,000 in Brazil **14,15**. The somatic cell count (SCC) of camel's milk was determined by the Fossomatic method and compared with biochemical compositions of the milk. The somatic cell count (SCC) ranged from 28.20 x 10<sup>3</sup> to 120.60 x 10<sup>3</sup> cells/ml with mean 68.87 x 10<sup>3</sup> cells/ml in the whole period. The level of somatic cell count (SCC) ranged from 28.20 x 10<sup>3</sup> to 65.78 x 10<sup>3</sup> cells/ml with mean was 42.21 x 10<sup>3</sup> cells/ml in colostrum milk **16**. The SCC is quantified as cells per ml. General agreement rests on the values of less than 100,000 cells/ml for uninfected cows and greater than 250,000 for cows infected with significant pathogens **17,18**. Some defect of somatic cells in the milk samples which stained by (ethidium bromide) and micro examination by florescent microscope **Figure 3**. The ethidium bromide dye penetrates the cell and forms a fluorescent complex with the nuclear DNA, in order to DNA staining and florescent microscopical examination to determine the defect of the somatic cells in milk camel and cows and differentiate between the types of somatic cells (epithelial cells, and lymphocytes). Which is encourages the dye (ethidium bromide) introducing into cells and intercalating of chromosomal DNA with the staining if cell by using UV light Ethidium bromide will stain only cells that have lost membrane integrity **19**.

**Table 1 : Somatic cell count (SCC) in the camels, and cows .Range and mean .**

Animal	Range . SCC. cell/ ml	Mean . SCC. cell/ ml
camel	400 000 - 800 000	560 000
cow	480 000 - 660 000	530 000



**Figure 2 :Somatic cells in the deferent focus of microscopical examination for she camel milk and cows milk stained by ( Newman Lambert stain ) .**



**Figure 3: Somatic cells of camel milk stained by florescent microscope High expression of the fluorescent repressors. Stained by (ethidium bromide) .**

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