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Research Paper

Analysis of *E.Coli* from Waste Effluents of a Farm Business

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Abstract

Microbial analysis of waste effluents from dairy farm business disclosed the presence of gram positive and gram-negative bacterium. Higher proportions of E.coli was mostly discovered in milk and food waste than cheese and butter effluent. There is important distinction in variety of microorganism colonies among farm waste outflows. Some strains of E.coli are morbific and might cause serious health problems for humans by direct or indirect waste like through water bodies into which waste outflow is poured.

Keywords: Waste Effluents; E. coli; Dairy Product

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1. Introduction

Because of its important contribution to the economic process and human welfare, industrialization had a major role in formulation of developmental strategies. Just like any other human activity, industrialization also brings about its impacts, typically leads to pollution and degradation. It imposes certain costs and issues in terms of air and water pollution and general loss of the environment [1-2]. Industries generally produce waste which are unusual regarding their kind, volume and frequency depending on the kind of business and population that uses the merchandise [3]. Waste originated from dairy farm operations could maintain human pathogens like *Escherichia coli.*

Due to the vast extension of the matter of bacterial contamination additional detailed studies on milk production and milk product to the consumption of milk together with all in-between levels seem necessary. The aim of this current analysis was to establish the existence and identification of E.coli from farm waste effluents.

2. Method

2.1 Sample Collection and Processing

For the purpose of this study different samples were collected during 2 consecutive months from waste effluents of butter, milk, yogurt and cheese produced after process of milk for creating completely different dairy farm products. Directly after taking from operation site, all samples were maintained at 4ºC.

In order to isolate *E.Colia*,'Theodor Escherich 1885' technique was used. Before opening any sample containers, the whole area was cleaned with 70% ethanol. Then 0.5 mil of samples were taken in 10 ml Lauria Bertini (LB) broth medium in autoclaved tube and shaken up for one minute till a homogenized mixture was obtained. Then the mixture was kept at room temperature for 30 minutes. After this time, with the assistance of micropipette the supernatant was taken out from the tube and added into another tube filled with 9 mil autoclaved water so as to form the 2-fold dilution. The dilution tube was shaken up, 500 microliter of the ultimate dilution tube

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were extended over the Petri dishes of MacConkey and LB medium by help of spreader. Petri dishes were maintained within incubator during 24 hours at 37ºC. After this time, plates were examined for microbial colonies grown on the media. In order to identify E.Coli various biochemical tests were performed such as Indole test, Indole spot test, Kovac's indole test, VogesProskauer test and Simmon's test.

3. Result and Discussion

E.coli is a common gut bacteria resident within the tracts of just about all mammals. Usually the amount of *E.coli* is outnumbered by 100-fold or more by strictly anaerobic gut bacteria [4]. *E.coli* is the cause of a number of diseases in humans as well as animals (Russo and Johnson, 2000). It is obvious that Shiga toxic E. coli (STEC) is the cause of human diseases, starting from uncomplicated diarrhea to serious complicati ons like the Hemolytic uremic syndrome. Many studies have reported high frequency of STEC occurrence, with various kinds of serotypes in animals and food products. However, only a few serotypes are related to human diseases [5].

E.coli collected from different samples was grown on LB medium and MacConkey medium for morphological characterization. After 24 hours, examination under microscope isolated 2 kinds of colonies on the premise of their characteristics. The said colonies had pink color whereas being creamy yellow in LB medium. It was observed that *E.coli* cultured on MacConkey Agar was capable of metabolizing lactose, which produces acid by-products that lower the pH level of the media. Milk and yogurt samples maintained the highest quantity of E.coli isolates. It is important to mention that the waste effluent milk was collected from the local brands in March (packed in business non-tetra pack) and butter samples were collected from local bakeries. The sample of waste effluent yogurt was collected in April from the local businesses (packed in business non-tetra pack) and cheese waste effluents collected from local bakeries. *Escherichia* bacteria species were found in 49 out of 64 samples studied.

The average amount of gram-negative bacteria in waste effluents of milk, butter, yogurt and cheese was 4.81 ± 0.35, 3.37 ± 0.30, 4.56 ± 0.32 and 4.00 ± 0.22 respectively.

From the results of milk samples it can be concluded that more than half of samples (57 out of 100) were contaminated by E.coli and served as a proof for confirmation of the works of Martin and his colleagues, 1986. Based on results of the samples of milk products most milk merchandise were contaminated with E.coli. In 1986, two cases of paediatric

Hemolytic uremic syndrome were investigated which was the primary to be associated to milk consumption and proved that cow's milk can be a vehicle for transmission of E.coli 0157:H7 infection [6].

4. Conclusion

Microbial evaluation of waste effluents of dairy farm industry proved the existence of some microorganism. Milk and yogurt effluents preserved the highest amount of E.coli while the lowest proportion was determined in cheese and butter waste effluents, which may contain serious health dangers to human.

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