INTRODUCTION
Milk and dairy products constitute important nutritional components for the entire age groups. Milk contains all the essential food constituents which help it to meet all the nutritional needs of body better than any single food. Milk is an excellent culture medium for many kinds of micro-organisms due to the presence of these nutrients. The incidence and growth of these organisms in milk brings about changes in the properties of milk thus reducing its quality (Edema and Akingbade, 2007).

Bacterial contamination in raw milk can originate from diverse sources: air, soil, feed, equipments used, faeces, grass and milking apparatus (Coorevits et al., 2008). The number and types of microbes in milk instantly after milking are affected by the factors such as animal and apparatus sanitation, feed, season and animal healthiness (Karmen and Slavica, 2008). It is hypothesized that differences in housing strategies and feeding of cows may have severe influence the microbial quality of milk (Coorevits et al., 2008). Rinsing water for milking equipment and milking machine washing is also one of the reasons for the occurrence of a higher number of microorganisms including pathogens in unprocessed milk (Bramley and McKinnon, 1990).

An analysis of raw milk samples and pasteurized milk, after processing and prior to packaging verified a union among the properties of the raw milk used and the pasteurized-milk produced (Elrahman et al., 2009). High bacterial counts are marker of poor production hygiene or unproductive pasteurization of milk. The pasteurization demolish non spore forming disease producing bacteria is a well-recognized public health practice. Thermoduric nonpathogenic bacteria belonging to the heat-resistant spore formers and Micrococcus belonging to the genus Bacillus or Clostridium, however, might be present in raw milk and survive these pasteurization procedures. These survivors, in addition to bacteria which gain access after processing, are responsible for the readily demonstrable spoilage of milk as it occurs under current situation of marketing and storage (Kaufmann and Brillaud, 1961).
Clostridium genus is Gram positive bacteria anaerobae, bacilli, negative oxidized, fermentative and catalase negative. The Clostridium is ubiquitous and some species can be related with the defined geographic areas. The main capability of Clostridium is to adapt different environmental conditions due to sporulation possibility (Ortega et al., 2012).

Clostridium perfringens, a part of common gut flora, is usually concerned in diseases in the majority of domestic animals and some wildlife, including horses, rabbits, birds, poultry, ostrich, sheep, goats, cattle, dogs and cats (Jakee et al., 2010). Clostridium perfringens is serious bacteria causing enteric diseases in domestic animals and food poisoning in human beings. Clostridium perfringens is the most important bacteria which cause diarrhea, it is a harmless member of the regular micro flora, but under certain situation, it can proliferate rapidly and produce toxins and degradative enzymes that are linked with serious enteric disease (El-moez et al., 2014).

Clostridium perfringens produces diverse toxins and is responsible for severe diseases in human beings and animals including intestinal or food borne diseases as well as gangrene. Individual strains produce only subsets of toxins and are characteristically divided into five toxins (A to E) based on their capability to synthesize Alpha, Beta, Iota, and Epsilon toxins. Delta toxin is one of the haemolysins among three, released by a number of Clostridium perfringens and also probably type B strains (Skariyachan et al., 2010).

Nutraceutical is a food that provides medical or health benefits, as well as the prevention, precaution and treatment of diseases. When functional food aids in the treatment and prevention of diseases and disorders other than anemia, it could be named as nutraceutical. Thus a functional food for one user can proceed as a nutraceutical for another consumer. The utilization of nutraceuticals as an attempt to achieve advantageous beneficial outcomes with reduced side effects as compare with other curative agents has met with great monetary success (Kalra, 2003).

Fruits, vegetables, herbs, whole grains, seed and nuts include plenty of sulphur compounds, pigments, phenol compounds, terpenoids, and other natural antioxidant that contains association with protection from and management of conditions. The
herbs and foods with the maximum anticancer activity comprises garlic, cabbage, soybean, root ginger and umbelliferous vegetables. Citrus in addition to providing a sufficient supply of folic acid vitamin C, potassium and soluble fiber contains a host of active phytochemicals (Sridivya et al., 2010).

Milk and milk products are among the most commonly consumed food products worldwide. Clostridium spp. is a common food contaminating anaerobic bacteria. Identification and molecular classification of Clostridium spp. is essential for the detail study of it. Because of the pathogenic properties, there is a requirement of studying the different characteristics of the species to obtain enhanced idea about the metabolic activity of cell and which would help in finding out best applicable ways to check its growth and reduce the probability of illness in human society. More detailed study also required on different nutraceuticals which could be further used in the deactivation of the toxins, which is much useful for the society and this would be serve as a great boon in the medical world.

In view of the above, the present study entitled “Evaluation of selected nutraceuticals for deactivation of Alpha toxin produced by Clostridium perfringens in dairy products” was carried out with the following objectives:

1. To isolate and identify Clostridium perfringens from selected dairy products.
2. To isolate and characterize Alpha toxin produced by Clostridium perfringens.
3. To validate selected nutraceuticals through in silico screening for alpha toxin deactivation.