POTENCY OF BALI CATTLE MILK AS FUNCTIONAL FOOD

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ABSTRACT

Functional food is a food that, should has characteristics such as: (1) based on the presence of physiologically active components, provide health benefit beyond its basic nutrition, (2) foods that are whole, fortified, enriched to enhanced health at levels beyond a general nutritional benefit (Shortt et al., 2004). The first International Conference East-West Perspective on Functional Foods 1996 stated that functional food is food that has active components which give health benefit, beyond its nutrients content.

Food and Drug parliament of Indonesia (2001) stated that functional food is food that naturally or has been processed, contain one or more ingredients accoeding to scientific analysis has specific physiological function that beneficial to health. Milk has been defined as an excellent food due to its complete nutrient components and easily digested compared to other food products. Generally milk contain 87.5% water, 4% lactose, 3.5% protein, 3% fat and 2% mineral and vitamins. Milk contain fat soluble vitamins (A, D, E, K) and water soluble vitamins (B1, B2, B6 B12, niacin, folate, panthotenic acid and C) needed for metabolic processes. Milk especially contain calcium and phosphor in ratio 1:1 which equal to the ratio that needed by people.

Milk is the most nearly perfect food, obtained through continuous milking of mammary gland, contains no colostrum, obtained through continuous milking of mammary gland of healthy dairy cattle. Since dairy cattle are the main source of milk production in the world, the word milk meant the milk from dairy cow, and milk obtained from mammals other than dairy cow, are namely that mammals milk, i.e goat milk, sheep milk, buffalo milk (Weimer, 2001). So that, milk obtained from bali cattle is named bali cattle milk.

Bali cattle milk contains nutrients which is higher than the milk of dairy cows particularly protein, fat and energy, respectively 58.75%, 109.48% and 89.81% higher than the protein, fat and energy of milk from Friesien Holstein (Sukarini, 2000).

Chemical analysis of Bali cattle milk in this study showed 4.90% protein, 5.70% fat, 4.90% lactose, 0.012% tryptophan, 0.14% total acidity, pH of 6.36 and 16.07% total solid. The chemical analysis of Bali cow's milk kefir: protein, lactose, fat, dry matter and tryptophan were 5.70%, 4.60%, 6.00 %, 17.70 % and 0.027 % respectively.

Keywords: Bali cattle milk, functional food

Introduction

Generally milk for people consumption was obtained from dairy cow, because this milk produced and available in large quantities, while the Bali cattle milk does not / can not be obtained easily. Bali cattle milk production is also not as high as milk production of dairy cows, but the daily body weight gain Bali calf until weaning is almost equal to the weight gain of dairy calf. Increment of daily weight gain of the calf nearly 0.25 to 0.27 kg / head / day for 205 days (Putra, 2008). This was owing to the higher quality of Bali cow milk...
compared to the quality of dairy cow milk, which contribute to fulfillments of the protein and energy requirements for growth of the Bali cattle calves.

Bali cow milk contains nutrients higher than that milk of dairy cows particularly protein, fat and energy, respectively 58.75%, 109.48% and 89.81% higher than the protein, fat and energy of dairy cow milk (Sukarini, 2000). This fact may taken into consideration to use Bali cattle milk as a functional food ingredient.

A food can be classified as a functional food if they meet one or both of the following criteria (1) containing compounds (nutrients or non-nutrient) that affects one or a limited number of physiological functions in the body that is interpreted as a positive effect (Bellisle, 1998); and (2) provide physiological or psychological effects beyond the usual nutritional effects (Clydesdale, 1997). The First International conferences East-West Perspectives on Functional Foods 1996. Functional food is food that is because the content of the active components may provide health benefits, beyond the benefits provided by the nutrients contained in dalammnya. According POM, 2001, Functional food is food that is natural and has been processed, containing one or more compounds that scientifically claimed, shown physiological health benefits. Fresh milk is one of the best functional food because it has a naturally complete nutrition. Fresh milk is also easily absorbed in the intestine. In general, the composition of fresh cow's milk is composed of 87% water, 4% lactose (carbohydrates), 4% protein, 3% fat and 2% mixture of vitamins and minerals. Vitamins contained in milk in the form of soluble vitamins (A, D, E, K) and water-soluble vitamins (B1, B2, B6, B12, niacin, folate, pantothenic acid and C). Milk also rich in minerals (calcium, forfor, magnesium, potassium, zinc, fluoride) necessary for the body building.

**Nutrient content of Bali cattle milk.**

Nutrient content of Bali cattle milk such as protein, fat, lactose, tryptophan, total acid, pH and dry weight were respectively 4.90%, 5.70%, 4.90% 0.0126, 0.14, 6.36 and 16.0%. (Suriasih, 2013). The protein content of Bali cow's milk, may generates higher as well as more type of bioactive peptide compounds, resulted from microbial fermentation processes in the manufacture of probiotic drink, kefir. The word kefir comes from the Turkish "keif" which means "feeling good / happy" so it can be assumed that by drinking kefir give pleasure and comfort (Hertzler and Clancy, 2003). In some countries like the Soviet Union, Hungary and Poland, kefir is a very popular drink, has been consumed since thousands of years ago and of about 70% of the total (11-15 kg / head / year) fermented milk consumption in these
countries. Kefir is well known in Sweden, Finland, Germany, Italy, Austria, Brazil and Israel, and increasingly popular in the USA and Japan, as well as already known in Argentina, Taiwan, Portugal, Turkey, France and Indonesia (Saloff-Coste, 1996; Lin et al., 1999), and in different countries kefir known by different names; for example kefir is called by the name of kephir, kiaphur, kefer, kapon, KEPI and kippi. Vinderola et al. (2005) stated that kefir is a fermented milk drink containing small amount of CO2 and alcohol as a result of the activity of lactic acid bacteria, yeasts and acetic acid bacteria from kefir grains.

Kefir made traditionally by adding a kefir 'seed' as much as 2-10% (v / v) to milk that has been pasteurized and cooled to a temperature of 20-25°C, then incubated at room temperature (27-28°C) for 24 hours. After the kefir grains are separated (by sieving), kefir filtrate was stored at 4°C for several hours and is ready for consumption, and kefir grains obtained, could be use to make kefir. Kefir made by this method has a quality that is less constant. Another way to make kefir on a larger scale is in two stages. The first stage is making a mother culture, in which kefir grains of (2-10% (g / ml)) was introduced to fresh or pasteurized milk and incubated for 24 hours at a temperature of 20-25°C. The grains were separated and the filtrate (mother culture) as much as 1-3% was added to the milk and incubated for 12-18 hours (Saloff-Coste, 1996). Fermentation time will affect the taste of kefir. Shorter incubation time produce kefir with moderate acidity and sweeter and longer incubation produce kefir with higher acidity. Raw milk used to make kefir can be derived from cow's milk, sheep, goat, buffalo or soy milk, and raw milk can be pasteurized or unpasteurized (Loretan et al., 2003; Farnworth, 2005).

The chemical composition of Bali cow's milk kefir, was greatly influenced by the raw material Bali cow's milk. The chemical analysis of Bali cow's milk kefir. of protein, lactose, fat, dry matter and tryptophan Bali cow milk kefir in a row of 5. %, 4.60 %, 6.00 %, 17.70 % and 0.027 %. Chemical components of Bali cow's milk is higher than that of kefir prepared from dairy cow milk namely: fat, protein, lactose and dry matter were respectively 3.5%, 3.3%, 3.5% and 12.5% (Saloff-Coste, 1996). The higher fat content of Bali cow milk may exert conjugated linoleic acid (CLA), a compound the shows anti carcinogenic properties (Kritchevsky, 2004)

**Conclusion**

Nutrient content of Bali cow's milk may take into consideration to be used as a functional food ingredient. Thus Bali cow's milk has the potential as raw materials for probiotic drinks such as kefir.
Reference


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Certificate of Completion

This is to certify that

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