

Application Of Hydrolysed Collagen In Dairy Products- A Review

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Abstract

This review paper highlights collagen hydrolysate proteins their nutritive value and use it in different dairy products. Dairy products have high nutritional value. Collagen has high nutritional and medicinal value. When collagen hydrolysate is added with fermented dairy products acts as an antioxidant, which prevents the growth of pathogenic microorganisms. Collagen hydrolysate can adhere to the calcium ions so it prevents calcium deficiency in bones. Hydrolyzed collagen shows low syneresis with Fermented dairy products. Collagen also increases the viability of probiotic microorganisms. Collagen does not adversely affect fat and lactose as well as the taste and flavor of the products.

Keywords: - Fermented dairy products, hydrolyzed collagen, health benefits.

INTRODUCTION

Today food industry has been undergoing constant changes for the development of different food products, which make the fulfillment of Nutrition. But every single product does not fulfill the complete nutrition so now a day develops different functional products by using functional ingredients such as proteins, vitamins, minerals, bioactive peptides, and probiotics, etc. (Ozer, and Kirmaci, 2010) Functional foods are the main source of development of foods and dairy industry. These foods have a lot of health benefits beyond those of basic nutrition for humans (Bigliardi and Galati, 2013). There are different types of functional foods such as baby foods, cereal foods, Dairy foods, confectionery foods, and beverages (Ofori, and Peggy, 2013). About 40% of functional foods are derived from dairy products (Turkmen, *et. al.*, 2019). Near about 28 types of collagens were discovered. Collagen is commonly found in skin, bone, teeth, tendon, ligaments, and organs. The second type is present in cartilage, collagen third types in skin muscles and blood vessels. The fourth collagen type is found in the epithelium secreted layer and basal lamina and lastly fifth type is found in the cell surface and placenta, Collagen is the extracellular matrix protein found in the animal's body. At the age of 17 collagen secretion decreases gradually by 1% every year-old person faces many health issues due to the

low amount of collagen proteins (Bateman, *et.al.* 1996). Collagen word derived from Greek word “Kolla” means “glue”. Collagen contains amino acids like glycine, proline, hydroxylysine, etc. Which increases the health benefits and nutritional value of the dairy products, This paper evaluates the available data which are published in different research articles regarding the hydrolyzed collagen used in the fermented dairy products. This review highlighted the role of hydrolyzed collagen with Fermented dairy products concerning the health benefits and nutrition.

Nutritional value of Collagen

Collagen has high nutritional and medicinal value. When collagen hydrolysate is added with fermented dairy products acts as an antioxidant, which prevents the growth of pathogenic microorganisms. Collagen hydrolysate can adhere to the calcium ions so it prevents calcium deficiency in bones. Heino *et.al.* (2007) reported in their investigation that collagen is a main structural protein in animal bodies. It is mostly found in skin, ligaments, tendons, cartilage, bones, blood vessels, gut, and in the vertebral disc. The collagen occupies about 25 to 35% of the total proteins, and it helps to make the structure of different body organs such as the skin and bones, etc. (Myllyharju, and Kivirikko, 2001, Buckley, *et.al.*, 2007). The collagen has been discovered 68 million years ago from fossilized bones of Tyrannosaurus rex fossil (Matsuda, *et. al.*, 2006). According to their structure collagen can be divided into 6 groups such as the fibril collagen, fibril-associated collagen, network forming collagen, and anchoring fibrils, transmembrane, and basement membrane collagens. etc. Hydrolyzed collagen-containing highly valuable amino acids such as glycine, proline, and hydroxyproline. Every amino acids have a specific function so hydrolyzed collagen is used as a food supplement. According to FDA, WHO, European Commission for health and consumer protection have confirmed that hydrolyzed collagen is very safe for human consumption but a rare side effect such as nausea, flatulence, or dyspepsia in some peoples (Oesser, *et.al.*, 1999), When hydrolyzed collagen orally ingested by human its results to hydroxyproline containing peptide increased in amount after collision intake and reached a top-level after 2 hours (Ohara, *et.al.*, 2007). An investigation by Leoz *et. al.*, (2019) suggested that food-derived gelatin orally ingested to healthy people after 12 hours of fasting results in over 24 hours period, amount of hydroxyproline-containing peptide compared to around 30% of all detected hydroxyproline. Whereas Amal, *et al.*, (2020) reported that the fish collagen used with Psidium guajava (PG) yogurt, its result decreases the pH level of final products and increases acidity. Zhu *et.al.*

(2010), reported that fish collagen is used to decrease systolic blood pressure by inhibiting ACE. Matsumoto, *et.al.* (2006), suggested that orally ingested fish collagen in a woman for 6 weeks, results in the improvement of skin condition. Schwartz and Park (2012), suggested daily one gram supplement of collagen hydrolysate for 12 weeks results to decrease skin dryness, scaling, and wrinkles from the skin. Vivas, *et. al.* (2017), reported a positive effect to inhibit the presence of the microorganism. Due to the low molecular weight and presence of free amino acids in collagen, it represents antimicrobial properties. We may use collagen hydrolysate as a functional ingredient in functional foods like sauces, soups, orange and apple juices, dairy beverages, and fermented dairy products Gerhardt *et.al.* (2013). Collagen hydrolysate added in fermented dairy products shows high bioavailability Holst and Willinmson (2008). Hydrolyzed collagen-containing hydroxylamine promotes assimilation due to these amino acids along with proline helps absorb in the gastrointestinal tract after injection Sontakke, *et. al.*, (2016),.Bilek and Bayram (2015), also reported the higher concentration of hydrolyzed collagen in whey beverages and observed higher bioavailability. The addition of hydrolyzed collagen in whey beverages increases nutritional value due to high protein concentration but not any adverse effect on milk constituents like fat and lactose (Arely Leon-Lopez *et.al.* (2020). In research by Pal and Suresh (2016) reported the ability of hydrolyzed collagen to adsorb (attach) calcium ions.

Conclusion

Various fermented dairy products, as well as hydrolyzed collagen, have considerable nutritional and medicinal potential. Every kilo-gram of body weight requires one gram of protein. Because a single item cannot provide a person's protein needs, the addition of hydrolyzed collagen to fermented dairy products significantly improves the nutritional value of the fermented dairy products. Using hydrolyzed collagen, it also aids in the development of new beneficial dairy products. Hydrolyzed collagen is an important antioxidant component that helps to keep pathogenic microbes out of dairy products. It also serves as a bioavailability indicator. These findings could have a significant impact on the development of fermented dairy products

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