Formulation of healthy food products from cocoa and soybean to prevent osteoporosis

Nurpudji A. Taslim
Hasanudin university, Indonesia

Abstract
Cocoa is a commodity that has very broad benefits, especially in the food, beverage, and pharmaceutical industries. Soybean is a commodity that has a high nutritional content and is a cheap source of protein. Soybeans contain an average of 35% protein and 18-20% fat. Besides, soy fat contains several important phospholipids such as lecithin, sefalain, and lipositol. Soybeans are also a source of vitamin B, vitamin E, vitamin K, calcium, phosphorus, and phytoestrogens. Phytoestrogens, which are active substances contained in soybeans, are recommended as an alternative hormone replacement therapy to prevent osteoporosis and show beneficial effects on bone health. Therefore, it is necessary to formulate healthy food products from cocoa and soybean commodities. There are four formulas tested chocolate soy beverage. Determination of the best formula by organoleptic test in 3 age groups, adolescents, adults, and the elderly. Testing of nutritional content in the form of proximate, calcium, amino acids, isoflavones, phytate), and fatty acids. Based on the best formula organoleptic test results produced chocolate soy beverage composition consisting of 4.25% moisture content, the ash content of 2.44%, 40.71% protein, 13.9% fat, carbohydrates 37.88%, crude fiber 0.84 %, calcium 0.44%, phytic acid 0.35%, total flavonoids 0.22%, catechins 0.12%. Amino acid composition consists of L-aspartic acid 2.256%, L-serine 1.456%, L-glutamic acid 3.948%, glycine 1.463%, L-histidine 2.250%, L-arginine 2.250%, L-threonine 0.912%, L-alanine 0.777%, L-proline 0.935%, L-tyrosine 1.135%, L-valine 0.683%, L-methionine 0.345%, L-lysine HCL 1.469%, L-isoleucine 0.736%, L-leucine 1.653%, L-phenylalanine 1.761%. While the fatty acid composition consists of palmitic acid 4.27%, stearic acid 2.40%, oleic acid / ω9 8.70%, linoleic acid / ω6 8.33%, linolenic acid / ω3 0.82%, arachidic acid 0.13%. The selected formula can be a good supplement product to prevent osteoporosis.

Conclusion:
The beneficial effects of cocoa cannot be disregarded as cocoa in the absence of sufficient dietary calcium still presented some protective effects on bone. We propose with proper dosing, together with an adequate calcium intake, cocoa may be able to present antiosteoporotic properties more efficiently.