



Corn gluten meal used as pet food, and feed systems

Mahyar Yousefi

Department of Food Technology, National Agriculture Education College, Kabul, Afghanistan

E-mail: yousefi@gmail.com

Protein hydrolysates from gluten meal (CGM) and distillers'-dried grains with solubles (DDGS) were prepared with Neutrase and Alcalase, and therefore the antioxidant activity of these hydrolysates in bulk oils, ground pork, canine pet food, and pig feed were evaluated by measuring oxidation stability supported peroxide value (PV) and thiobarbituric reactive substances (TBARS) value. Alcalase-hydrolyzed CGM (CPH-A) and Neutrase-hydrolyzed CGM (CPH-N) had stronger 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity than Alcalase-hydrolyzed DDGS (DPH-A) and Neutrase-hydrolyzed DDGS (DPH-N). The CPH-N showed better prevention on lipid oxidation in both vegetable oil and animal oil compared with other corn antioxidants. the simplest oxidation prevention in ground meat was observed with 2 g/kg of CPH-N. Lipid oxidation in pet food containing 2% DPH-A was efficiently retarded by 37.8% reduction at the top of the incubation, and TBARS value of pig feed containing 2% CPH-N was reduced the foremost compared with other treatments. Overall, CGM and DDGS protein hydrolysates could potentially be used as naturally derived antioxidant in food, pet food, and feed systems with good protection efficiency for lipid oxidation to enhance product storage stability. The formation of off-flavor and various oxidation products like peroxides, hydroperoxides, aldehydes, and ketones leads to the loss of food texture, aroma, taste, nutrient, and shelf stability also as causing food safety concerns To retard lipid oxidation, antioxidants are widely utilized in these products. Synthetic antioxidants like butylated hydroxytoluene (BHT), butylated hydroxyanisole (BHA), propyl gallate (PG), and

ethoxyquin (EQ) are commonly utilized in various food and feed products. However, it's been reported that such antioxidants possibly increase health risks thanks to their toxicity and carcinogenicity [5,6]. In recent years, there's a growing interest in developing natural antioxidants with high efficiency and low cost. Some plant extracts are reported to inhibit lipid oxidation in several food products, like extracts from vegetable oil mill waste, broccoli sprout extract [8], ginger powder and garlic extract. Numerous studies have shown that the hydrolysates or bioactive peptides produced from rice bran protein] milk casein, soy protein, sorghum kafirin and corn protein exhibited high antioxidant activities in both in vitro and in vivo models. Antioxidative hydrolysates or peptides can inhibit oxidation by various mechanisms counting on their molecular characteristics also as oxidation systems they're added into. Those peptides antioxidants have the capacity to scavenge free radicals or chelate metal ions. additionally, they will also prevent oxidation by forming physical barrier around lipid droplets in some oil-rich systems like emulsion. Corn is one among the foremost cultivated crops worldwide and is a crucial food, feed, and biofuel source within the U.S. Previous research has shown that specific protein hydrolysates or peptides produced from corn protein exerted significant antioxidant properties in scavenging free radicals or chelating transitional metal ions Alcalase (from bacillus licheniformis) and Neutrase (from bacillus amyloliquefaciens) are two enzymes with high efficiency which are commonly used for food protein hydrolysis for antioxidant production