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## **Fish meal replacement by soybean meal has disruptive effects on fish reproduction**

**\*T. Bagheri**

Assistant Prof., Agricultural Research Education and Extension Organization,  
Iranian Fisheries Science Research Institute, Offshore Research Center, Chabahar, Iran

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### **Abstract**

Phytoestrogens are substances that are naturally occurring in the plants with estrogenic activity. Unlike naturally-occurring vertebrate steroids, phytoestrogens have a weaker strength, not stored in the body, easily decomposed and excreted through normal metabolism. Among the isoflavonoids main phytoestrogens are genistein and diadzin, which are defined as estrogenic compounds and found in soybeans at a ratio of 1.3% and 1%. Soybean is a protein source. The average protein content of soybean is approximately 40%. Therefore, the raw powder is high in terms of crude protein and the ratio of essential amino acids is highly desirable. In the aquaculture industry, inclusion of soybean meal in fish diets has not been completely accepted, due to the concerns about the undesirable effects on health and reproduction development. One of the reasons for worrying about the use of soybean is the presence of large amounts of phenolic compounds, which are called isoflavones and can have potentially biological effects on the organisms. In other words, the reproductive effects of intercurrent interactions with phenol compounds in soybeans that are phytoestrogens are not fully understood in fish. Therefore, the present paper addresses the various physiological effects of soybean in aquatic diets.

**Keywords:** Diet, Replacement, Reproduction, Soybean