The effects of substituting *Dunaliella salina* algae with agricultural by-products and probiotic *Lactobacillus rhamnosus* on growth indices, proximate body composition and fatty acids profiles of *Artemia franciscana*

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Abstract

The aim of this study was to evaluate the effect of partial replacement of *Dunaliella salina* algae with wheat and rice bran and *Lactobacillus rhamnosus* probiotic on growth indices, approximate qualitative factors and the fatty acid profile of *Artemia franciscana* during 17 days culture period. The present research was designed as a 2×4 factorial experiment in a completely randomized design with 8 treatments and three replicates. The treatments were different in terms of the type of diet (wheat bran, rice bran, mixture of wheat bran, rice bran and *Dunaliella salina* algae) and also in the probiotic level (0 and 10 percent of daily diet). At the end of experiment the samples were collected to measure the growth parameters, carcass composition, and fatty acid analysis. The results indicated that the *Artemia* in treatment 2 (85% wheat bran, 15% *D. salina)* exhibited the highest level of total fat (21%), saturated fatty acids, SFA, (11.90 ± 2.54 mg g^{-1} wet tissue), unsaturated fatty acid with one double bond, MUFA, (18.56 ± 3.22 mg g^{-1} wet tissue), linoleic acid, LAN, (10.79 ± 1.43 mg g^{-1} wet tissue), ash (12.15 ± 0.29%) and the lowest food conversion rate, FCR, (1.51 ± 0.03) compared to other treatments ($p<0.05$). Moreover the treatment 4 (42/5% wheat bran, 42/5% rice bran, 15% *D. salina*) demonstrated lowest level of specific growth rate (SGR), (27.97 ± 0.05) and dry weight percentage of carcass (7.98 ± 0.08%) among other treatments. The *treatment* 1 (100% *D. salina*) showed the lowest ash and the highest FCR and DHA and EPA fatty acids compared to other treatments ($p<0.05$). Finally we can conclude that wheat bran and combination of wheat bran with probiotic may be the most suitable alternative food to replace *D. salina* in *A. franciscana* diet.

Keywords: Wheat bran, Rice bran, Approximate analysis, Fatty acids, Probiotics, *Artemia franciscana*

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