

EFFECT OF USING DATES KERNEL MEAL (*PHOENIX DACTYLIFERA*) BIOLOGICAL TREATMENTS ON THE PROTEIN PRODUCTIVE VALUE AND DIGESTION COEFFICIENT OF COMMON CARP (*CYPRINUS CARPIO* L.)

Hamza G. Al-Agidi¹, Mohammad H. Al-Ashaab² and Khlood A. Ikhafaji²

¹Technical College, Al-Musaib, Iraq.

²Agricultural Researcher Directorate, Ministry Science and Technology, Baghdad, Iraq.

(Received 21 February 2019, Revised 23 May 2019, Accepted 11 June 2019)

ABSTRACT : The study was carried out in the laboratories of the Animal and Fisheries Resources Center, Agricultural Research Directorate, Ministry of Science and Technology to study the effect of using different levels of date kernel meal (DKM) *Phoenix dactylifera* treatment by bread yeast (BY) *Saccharomyces cerevisiae* and commercial diet enzyme (CDE) on the protein productive value (PPV) and apparent digestible coefficient (ADC) and apparent protein and fat detestable (APD and AFD) of the common carp fish *Cyprinus carpio* L., 300mg of BY/kg was added to the DKM and covered for 48 hours at laboratory temperature. The CDE was added to the date kernel meal at 2.5 g/kg. The T₁ without DKM, T₂, T₃ and T₄ use DKM untreated at ratio at 8.34%, 16.67% and 25% by substitute ratio 33.3% and 66.6% and 100% for the yellow corn respectively, T₅, T₆ and T₇ used DKM treatment by BY at the same ratio above, T₈, T₉ and T₁₀, used DKM treatment by CDE at the same ratio above. The results of the chemical analysis showed an improvement in the nutritional value of DKM treatment by BY and CDE. The percentage of protein increased from 8.21% to 11.08% and 9.82% respectively and the percentage of fiber decreased from 26.25% to 19.13% and 21.24% respectively. Results of the statistical analysis for ADC and ADC showed no significant differences between T₁ and the biological treatments (BY and CDE) at substitutions ratio 33.3% and 66.6% for BY treatment (T₅ and T₆) and substitutions ratio 33.3% for CDE. While all biological treatments for APD and PPV showed no significant differences in substitutions ratio 33.3% and 66.6% with T₁, which distinction on all total substitutions ratio and the without treatment T₂, T₃ and T₄. It was concluded from this study the positive effective of biological factors to improving the nutritional value of DKM by treated with BY and CDE. The values of BY were the most efficient and there was possibility to use DKM, which treated by BY at ratio 16.67% substitutions 66.6% from yellow corn.

Key words : Date kernel meal, bread yeast, protein productive value, digestion coefficient.

INTRODUCTION

Researchers have turned to use of agricultural and industrial residues and wastes with appropriate energy content as feed substitutes and replacing them with traditional sources of fodder in fish. The feed cost represents more than 50% of the aquaculture production costs in semi-intensive aquaculture (De Silva, 1993; Thomson *et al*, 2005). Therefore, researchers tried to find non-conventional feed sources and alternatives to reduce the cost of nutrition. These alternatives need to be studied and evaluated for achieving complete or partial replacement of traditional feed sources (Al-Ashaab *et al*, 2017). The kernel seeds of date palm fruits from these wastes. It is rich in energy. The protein content is not less than 7% and the moisture is less than 8%. Raw fibers is less than 40%, the crude ash does not exceed 9% (Al-Ashaab *et al*, 2018). Studies have shown that it is

contain a high percentage of energy equivalent to the energy found in traditional sources of feed, such as corn, barley and wheat bran. Kernel formed about 25% of the Dates, so the amount of kernels that are left behind is high (Muhammad *et al*, 2017). The date kernels are poor quality feed and low digestion coefficient, mainly due to the high lignin contents of the cell wall, which is associated with cellulose and hemicellulose with strong bonds that are difficult for the fish to break down due to lack of specialized enzymes, thus reducing the use of it as a fish feed (Peter, 2007). Improving the nutritional value of poor quality feeders can be done in several ways, including physical, chemical and biological treatments (Yalcin and Önel, 1994; Mohsen *et al*, 2017). The main aim of these treatments is to expose as much as possible raw carbohydrates, cellulose and hemicellulose, to the enzymes produced by microorganisms and convert them into soluble