	جامعة الفيوم كلية الزراعة قسم علوم وتكنولوجيا الأغذية	

رقم البحث: السابع

عنوان البحث باللغة الإنجليزية: The Impact of *Chlorella vulgaris* Fortification on the Nutritional Composition and Quality Characteristics of Beef.

الباحثون المشاركون:

Basma R. Abdel-Moatamed, Alla-Eldeen M. A. El-Fakhrany, Nady A. A. Elneairy, Mohamed Mahmoud Shaban and Mohamed H. H. Roby

Food Science and Technology Department, Faculty of Agriculture, Fayoum University, Fayoum 63514, Egypt; bra11@fayoum.edu.eg (B.R.A.-M.); ama19@fayoum.edu.eg (A.-E.M.A.E.-F.); nan00@fayoum.edu.eg (N.A.A.E.); mmm12@fayoum.edu.eg (M.M.S.)

ملخص البحث باللغة الانجليزية:

Chlorella vulgaris (C.V) is known for its high protein and nutrient contents and has been touted as a potential functional ingredient in food products. For this study, beef burgers were formulated with varying levels of Chlorella vulgaris fortification (0%, 0.5%, 1%, and 1.5% by weight). The nutritional composition, including proximate analysis and mineral content, was determined for each treatment group. The quality characteristics evaluated included thiobarbituric acid (TBA), total volatile base nitrogen (TVBN), pH, and total acidity. The study included extracting the active substances from Chlorella vulgaris using three solvents, 50% ethanol, 95% ethanol, and water, to evaluate the effect on the antimicrobial and antioxidant activity. The results showed that the water extract had the highest total phenolic content (183.5 mg gallic acid equivalent per gram) and the highest flavonoid content (54 mg quercetin per gram). The aqueous extract had the highest content of total antioxidants, followed by the 95% ethanol and 50% ethanol extracts. Meanwhile, the 50% ethanol extract showed the best antimicrobial activity, while the aqueous extract had less of an effect on Gram-positive bacteria and no effect on E. coli.For the burger treatments, at the end of the storage period, it was observed that the microbial load of the treatments decreased compared to the control, and there was a high stability in the total volatile base nitrogen (TVBN) values for the treatments compared to the control, reaching a value of 22.4 at month 5, which is well above the acceptable limit, indicating spoilage. The pH values were higher for all of the treatments, with a lower total acidity for all of the treatments compared to the control. In conclusion, utilizing Chlorella vulgaris algae as anatural preservative to extend the freshness of burgers is a sustainable and innovative approach to food preservation. By harnessing the power of this green superfood, we not only enhance the shelf life of our food products but also contribute to a healthier and more environmentally friendly food industry.