Microbiological, Chemical and Organolitical Evaluation for Irradiated white Shrimp

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Introduction
The present study was carried out to evaluate the microbiological, chemical and organolitical aspects of irradiated white shrimp to extend its shelf-life. In this investigation, the shrimps were irradiated at five doses (1.5, 3.0, 4.5, 6.0 and 9.0), used for preservation, to study the effect of these doses on the microbiological aspects, fatty acids, amino acids and organolitical properties of shrimp post-irradiation or after 20 days of storage in comparison with the commercial ones.

Materials and Methods
Samples
Fresh white shrimp (Metapenaeus affinis), approximately 25 kg, were obtained from Al-Qatif Fish market in eastern province of Saudi Arabia. This market is one of the main sources of fish and white shrimp in the kingdom. The white shrimp was iced and arranged in plastic bags and covered with ice during sampling and transportation to gamma irradiation. Samples were irradiated by Co-60 source (Nutronic) at 1.5, 3.0, 4.5, 6.0 and 9.0 KgY.

Microbial content assay
Total aerobic bacterial counts enumerated on plate count agar as described by [1] while total mold and yeasts were counted on malt extract agar medium [2].

Chemical analysis
Fatty acids and amino acids were determined according to the method described [3].

Organoleptic evaluation:

Organoleptic Test: Fresh white shrimp was submitted to 10 panelists for evaluation. The ranking method was used in combination with scoring based on the hedonic scale with 9 scores ranging from "dislike extremely" to "like extremely". The results were analyzed using analysis of variance [4].

Discussion
The results of radiation treatment white shrimp led to reduce the microbial count, Staphylococcus aureus, microganism very much, as microbes destroyed the completely Salmonella. The fatty acids composition of irradiated and non-irradiated shrimps were qualitatively similar, since no new fatty acids or other artefacts due to irradiation were observed; the relative percentage of total unsaturated fatty acids of all shrimp lipids was slightly decreased with increasing the irradiation dose, which indicated the possibility of unsaturation to be oxidized by irradiation. The present results indicated that shrimp, which rich source for a proteins, is adequate to fulfill major part of the requirements for human foods. As the results indicated that the shrimp proteins under investigation contained most of the known amino acids particularly the essential amino acid valine, which was found in the amount of 7.4% and other amino acid were found in considerable quantities. Considering the organoleptic evaluation, it could be concluded that the optimum irradiation doses for shrimp should not exceed 3.0 and 4.5 KgY without adverse effect on their chemical and organolitical properties.

Conclusion
To sum up, Gamma irradiation caused a great reduction in microorganisms and this reduction was proportional with irradiation dose, it could be concluded that the optimum irradiation doses for shrimp should not exceed 3.0 and 4.5 KgY without adverse effect on their chemical and organolitical properties. Conclusion Accordingly, the present study recommends utilizing γ-irradiation for preservation of White Shrimp and other Fish.

References
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