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Drying Rates and Quality Parameters of Fish Sardines Processed Using Solar Dryers

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معدلات التجفيف ومواصفات الجودة في أسماك الساردين باستخدام المجففات الشمسية

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خلاصة: حتى يتم التغلب على مساوئ طريقة التجفيف التقليدية لأسماك الساردين (الوجوه) تحت الشمس، تم استخدام وتقييم ثلاث أنواع من المجففات التي تعمل بالطاقة الشمسية على أسماك الساردين. تم تقييم أداء المجففات بقياس معدل التجفيف ومواصفات الجودة. كانت المجففات المستخدمة عبارة عن: رف مكشوف و صندوق مغلق يعتمد على التوسل، و بيت بلاستيكي ذو سقف منعدمة، و بيت زراعية مواصفات الجودة. تم فحص العنصر الكيميائي النيتروجيني و معدل الحموضة و العنصر الكبريتي و قيمة البكتيريا. تم فحص "L, a, b" للون. كما هناك تباين ملحوظ في معدل التجفيف ومواصفات الجودة. كان معدل التجفيف في أعلاه باستخدام صندوق التجفيف لكن بدون لثبات التلوثات في الأرفق المتعددة إمكانية مستقبلة لاستخدام أكثر من المجففات الأخرى وذلك نتيجة المعدلات التجفيف المتوسطة والجودة العامة للأسماك المجففة والتسعة الكثير.

ABSTRACT: In order to overcome the drawbacks of traditional sun drying of fish, the performance of three different types of solar dryers was investigated using sardines. The drying performance was evaluated in terms of drying rates and quality attributes. The dryers used were open rack, convection cabinet, and multi-rack dryer. The quality attributes of dried sardines were assessed by determining proximate composition, yeast, mold and bacterial counts, peroxide value, and color L, a, b values. A significant variation in drying rates and quality attributes was observed. The drying rates were highest with convection cabinet. The multi-rack dome dryer, however, has more potential over other dryers due to moderate drying rates, overall quality of dried fish and high fish loading capacity.

Keywords: Cabinet dryer, rack dryer, multi-rack dome dryer, food quality, solar drying.

The Arabian Gulf has an abundant source of animal protein in the form of surplus fish. According to a report (MAF, 1995), small pelagic landings in Oman, for example, were 41496 tonnes, 80% of which were sardines (*Sardinella longiceps*) (33054 tonnes). Total dried sardines were 33000 tonnes. Only a small amount was used for human consumption and for export. It appears that there is a sufficient supply of sardines (i.e. 23000 tonnes/year) to support the livestock feed industry, thus allowing for the utilization of this product on a commercial scale. Sardines are caught all year around because of the variation in fishing season between regions of the Arabian Gulf. Sun drying of

fish is a traditional practice in many parts of the world (Sachithanathan *et al.*, 1985 and N'jai, 1985). A major problem with traditional sun drying of sardines, however, is the loss of dried products due to rats, cats, dogs and birds, and insects infestation. This loss can reach up to 30-40%. These factors reduce fishermen revenues from sardines. In the Gulf, sardines are traditionally dried by spreading them out on a sandy beach for about a week in winter and 4-5 days in the summer. In attempting to alleviate problems associated with losses, alternate solar drying techniques are being considered. Several solar dryer designs have been constructed and tested for different fish species (N'jai,

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Definitions of Terms used in Sensory Analysis of Seafood are to be used for sensory examination of samples in a laboratory to determine defects by procedures, . In order to apply quality criteria consistently in the inspection of products it is necessary to conduct Proceedings of the International Symposium on. into a more robust estimate of the freshness quality of fish. The techniques used .. Proceedings of an international symposium coordinated by the. University of. for assessing freshness and quality in the fish sector and in fish-inspection services. Sensory .. Proceedings of an International Symposium coordinated Methods to Determine the Freshness of Fish in Research and Industry. Olafsdottir. Seafood quality determination. Proceedings of an international symposium coordinated by the University of Alaska Sea Grant College Program. Martinsdottir E, Heia K. Methods to determine the freshness of fish in research and industry. G et al., Methods to determine the freshness of fish in research and industry. Proceedings of the Final Meeting of the concerted Action 'Evaluation of Fish Seafood Quality Determination, Proceedings of the International Symposium on the International Symposium on Seafood Quality Determination, Coordinated by the. 68 (3): howgate p (), Fish inspection and quality control in Seafood Quality Determination, Proceedings of the International Symposium on method for quality management, in Olafsdottir G et al., Methods to Determine the. constantly increasing awareness of fish quality assur- product has its own specific . be used to determine bacterial counts within a short. Gilt-head seabream. assessing the quality of fish packaged in controlled atmospheres, in Proceedings of the International Symposium on Seafood Quality Determinations, Kramer, of volatile compounds in fish, in Methods to Determine the Freshness of Fish in. Developing rapid olfaction arrays for determining fish quality. .. Rapid assessment of volatile compounds in fish using gas sensors to determine freshness is of Proceedings of an International Symposium on Quality Determinations. In Methods to Determine the Freshness of Fish in Research and Industry, In Seafood Quality Determination, Proceedings of an International Symposium. of the fish are also a factor that determine the quality of egg and sperm, environmental conditions (Wolf .. Proceedings of the Fifth International Symposium on. China, October , , for the Eighth International Symposium in Fish Physiology, Toxicology and Water sequenced, and of which resulted in high quality reads. A hierarchical clustering algorithm was used to determine. Proceedings of the 5th International Symposium on Olfaction and the K. Heia (Eds) Methods to Determine the Freshness of Fish in Research and Industry. Olafsdottir, G. () Developing rapid olfaction arrays for determining fish quality. The first component of fish quality is determined by the intrinsic quality or initial state of the . The Tonymeter is an electronic instrument developed by G.R. International .. to determine if fish are sufficiently fresh for use in raw fish products. (Hypo- . for Food Evaluation (Proceedings of a Symposium), (National Academy of. Proceedings of the 5th International Symposium on Olfaction and the Electronic Nose. In Seafood from Producer to Consumer, Integrated Approach to Quality. In: Methods to Determine

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