

Pengaruh Dosis Radiasi Sinar X-ray Terhadap Kualitas Kimia dan Fisik pada Bakso Daging Sapi

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INTISARI

Penelitian ini bertujuan mengetahui kualitas fisik dan kimia pada bakso daging sapi yang diberi perlakuan iradiasi sinar *x-ray*. Penelitian ini menggunakan teknologi sterilisasi berupa teknologi iradiasi dengan *x-ray bremsstrahlung*. Dalam penelitian ini, dosis radiasi yang diterapkan pada bakso adalah sebagai berikut: 0 kGy, 2 kGy, 4 kGy, 6 kGy, 8 kGy, 10 kGy, dan 12 kGy. Hasil penelitian yang dilakukan pada hari ke-14 dengan suhu refrigerator mencakup uji kualitas fisik, yaitu pH, daya ikat air dan keempukan, serta uji kualitas kimia, yaitu kadar air, kadar protein dan kadar lemak. Penelitian dilakukan di Laboratorium Ilmu dan Teknologi Daging, Fakultas Peternakan, Universitas Gadjah Mada. Data kualitas fisik dan kimia dianalisis dengan analisis variansi pola searah dan dilanjutkan dengan uji *Duncan's Multiple Range Test* (DMRT). Penelitian ini dilakukan di Laboratorium Ilmu dan Teknologi Daging, Fakultas Peternakan, Universitas Gadjah Mada. Berdasarkan penelitian telah diperoleh perlakuan iradiasi berpengaruh nyata ($P < 0.05$) pada beberapa dosis perlakuan pada beberapa dosis perlakuan terutama pada kadar protein mengalami penurunan secara signifikan ($P < 0.05$) dengan iradiasi dibandingkan kontrol. Hasil analisis kualitas kimia jika dibandingkan dengan kontrol menunjukkan bahwa kadar air dan protein, seiring dengan peningkatan dosis nilainya mengalami penurunan, sedangkan, kadar lemak, pada penelitian ini meningkat seiring dengan peningkatan dosis iradiasi. Berdasarkan penelitian telah diperoleh perlakuan iradiasi berpengaruh nyata ($P < 0.05$) pada beberapa dosis perlakuan pada kualitas fisik, jika dibandingkan dengan kontrol menunjukkan bahwa pH dan daya ikat air, dengan peningkatan dosis, nilainya mengalami peningkatan. Namun, pada keempukan, dengan peningkatan dosis, nilainya mengalami penurunan. Hal ini menunjukkan bahwa proses iradiasi *x-ray* hari ke-14, pada beberapa kualitas bakso masih sesuai standar SNI. Namun, menurun kualitasnya sehingga dapat disimpulkan bahwa iradiasi *x-ray* belum dapat mempertahankan kualitas bakso daging sapi pada hari ke-14.

Kata kunci : Radiasi, *X-Ray bremsstrahlung*, Kualitas, Fisik-kimia, Bakso

Effect of X-ray Radiation Dose on Chemical and Physical Qualities of Beef Meatballs

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ABSTRACT

This research aimed to determine the physical and chemical qualities of beef meatballs subjected to X-ray irradiation treatment. The study utilized sterilization technology in the form of X-ray bremsstrahlung irradiation. In this study, radiation doses applied to the meatballs were as follows: 0 kGy, 2 kGy, 4 kGy, 6 kGy, 8 kGy, 10 kGy, and 12 kGy. The research results, conducted on the 14th day at refrigerator temperature, encompassed physical qualities tests, including pH, water binding capacity, and tenderness, as well as chemical qualities tests, including moisture content, protein content, and fat content. The research was conducted at the Laboratory of Meat Science and Technology, Faculty of Animal Science, Gadjah Mada University. The physical and chemical qualities data were analyzed using one-way analysis of variance and further tested with Duncan's Multiple Range Test (DMRT). Based on the research, it was found that irradiation treatment had a significant effect ($P < 0.05$) on some treatment doses, especially in the case of protein content, which experienced a significant decrease ($P < 0.05$) compared to the control. Chemical qualities analysis compared to the control showed that moisture and protein content decreased with increasing radiation doses, while fat content increased with increasing radiation doses. Based on the research, it was concluded that irradiation treatment had a significant effect ($P < 0.05$) on some aspects of physical qualities. pH and water binding capacity increased with increasing doses, but tenderness decreased with increasing doses. This indicates that the X-ray irradiation process on the 14th day still met the SNI (Indonesian National Standard) standards in some aspects of meatball qualities. However, overall qualities declined, leading to the conclusion that X-ray irradiation was unable to maintain the qualities of beef meatballs on the 14th day.

Keywords : Radiation, X-ray bremsstrahlung, Quality, Physical-chemical, Meatballs