

**ANALISIS MUTU AYAM KALASAN UNGKEP BEKU  
PASCA PENGANTARAN PADA VARIASI PERLAKUAN  
PEMBEKUAN, KEMASAN, DAN JENIS TRANSPORTASI**

**INTISARI**

Daging ayam merupakan produk hewani yang termasuk dalam kategori pangan mudah rusak (*perishable food*), sehingga diperlukan penanganan yang tepat dalam menjaga kualitas produk sampai ke konsumen. Salah satu cara efektif untuk mempertahankan kualitas daging ayam adalah dengan menggunakan metode pembekuan. Namun demikian, proses pembekuan secara lambat menghasilkan kristal es berukuran besar yang dapat merusak struktur jaringan otot. Selain proses pembekuan, pengantaran produk juga dapat mempengaruhi kualitas produk akibat perubahan suhu, kelembaban, dan guncangan selama di perjalanan. Penelitian ini bertujuan untuk mengetahui besarnya perubahan suhu, kelembaban, dan guncangan yang terjadi selama pengantaran produk Ayam Kalasan ungkep beku menggunakan Data Logger Testo 184 G1, serta menganalisis pengaruh faktor pembekuan, kemasan, dan jenis transportasi pada produk pasca pengantaran untuk menentukan kombinasi terbaik menggunakan metode Taguchi berbasis *Orthogonal Array* (OA) jenis  $L_4(2^3)$ . Parameter mutu yang diamati meliputi kadar air, daya ikat air, *drip loss*, dan daya putus. Pengolahan dan analisis data dilakukan menggunakan perhitungan efek *means*, efek *Signal to Noise Ratio* (SNR), ANOVA, dan *Grey Relational Analysis* (GRA). Hasil pada pengukuran suhu, kelembaban, dan guncangan menunjukkan bahwa pada pengantaran menggunakan mobil berpendingin terjadi penurunan suhu, peningkatan kelembaban, dan tingkat stabilitas yang lebih besar. Berdasarkan hasil analisis, faktor pembekuan dan kemasan berpengaruh signifikan terhadap kualitas mutu Ayam Kalasan ungkep beku dalam 4 parameter (kadar air, daya ikat air, *drip loss*, dan daya putus). Pada faktor jenis transportasi berpengaruh signifikan terhadap kualitas mutu Ayam Kalasan ungkep beku dalam 3 parameter (kadar air, daya ikat air, dan *drip loss*). Kombinasi terbaik pada penelitian ini adalah perlakuan Ayam Kalasan ungkep beku dengan pembekuan cepat, perlakuan kemasan tanpa *styrofoam box*, dan pengantaran menggunakan jenis transportasi mobil berpendingin.

Kata Kunci: Ayam Kalasan, Pembekuan, Pengantaran, Rantai Dingin, Taguchi

## **QUALITY ANALYSIS OF POST-DELIVERY FROZEN BRAISED AYAM KALASAN ON VARIATION OF FREEZING METHOD, PACKAGING, AND TYPES OF TRANSPORTATION**

### **ABSTRACT**

Chicken meat is an animal-based product categorized as perishable food, requiring proper handling to maintain its quality until it reaches the consumer. One effective method to preserve the quality of chicken meat is by freezing it. However, slow freezing can lead to the formation of large ice crystals that may damage the muscle tissue structure. In addition to the freezing process, product delivery can also affect quality due to temperature fluctuations, humidity changes, and mechanical shocks during transportation. The purpose of this study is to determine the magnitude of changes in temperature, humidity, and shock that occur during the delivery of Frozen Braised Ayam Kalasan using the Testo 184 G1 Data Logger, as well as to analyze the effect of the freezing method, packaging, and types of transportation on post-delivery Frozen Braised Ayam Kalasan with variations in freezing method, packaging, and types of transportation on the quality of product after delivery. The goal is to determine the optimal combination using the Taguchi method based on Orthogonal Array (OA) type  $L_4(2^3)$ . The quality parameters observed include moisture content, water holding capacity, drip loss, and shear force. Data processing and analysis were performed using the calculation of means effect and Signal to Noise Ratio (SNR), ANOVA, and Grey Relational Analysis (GRA). The results on temperature, humidity, and shock measurements showed that delivery using a refrigerator car resulted in a decrease in temperature, an increase in humidity, and a greater level of stability. Based on the results of the analysis, the freezing method and packaging factors have a significant effect on the quality of Frozen Braised Ayam Kalasan in 4 parameters (moisture content, water holding capacity, drip loss, and shear force). Meanwhile, the transportation type factor significantly affects the quality of Frozen Braised Ayam Kalasan in 3 parameters (water content, water holding capacity, and drip loss). The best combination in this study was the treatment of Frozen Braised Ayam Kalasan with a quick freezing method, packaging treatment without a styrofoam box, and delivery using a refrigerator car.

Keywords: Ayam Kalasan, Freezing, Delivery, Cold Chain, Taguchi