



WHERE GLOBAL PET FOOD MEETS

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## **Effect of dehydration on textural, chemical and color properties of jerky treats using swine pluck**

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### **Abstract details:**

The pet food and treat market has consistently expanded. Meat animal processing co-products are often sold at a lower price for the rendering process. The pet food industry utilizes these co-products as a rich protein source for pet food and treats. Consequently, swine pluck (SP), a combination of heart, lungs, esophagus and trachea, can be included as a protein source in pet food and treats due to its convenient single-unit removal during processing. Sensory parameters such as texture and color can play a major role for pet owners when purchasing products for their pets. Therefore, quantitative data on those parameters can ultimately be used to assess suitability of a new product for market when combined with pet owner preference information.

The objective of this study was to assess the effect of dehydration time on various organoleptic characteristics such as physico-chemical, textural and color parameters on jerky style treats made with SP.

For sample preparation, raw SP was ground using a 4.76-mm grinder plate, mixed with sodium alginate (1%), and encapsulated calcium lactate (0.85%), extruded into jerky strips and refrigerated for 16 h at 4 °C to allow product gelation. Then, 3-inch jerky strip samples were dehydrated at 68 °C for 5 different dehydration times (3h, 4h, 5h, 6h and 7h). For data collection,  $n \geq 8$  samples were used on each analysis. A TA-HD plus C texture analyzer was used to conduct shear force (SF) test using a TA-42 45° angle chisel blade probe and a 3-point-bend (3PB) test using a TA-43R probe. Water activity ( $a_w$ ) was measured using an Aqualab 4TE water activity meter and the AOAC 950.46 moisture content method was used to determine moisture content (MC). Instrumental color was assessed on d 0, 1, 3, 5, 7 post-production time points using a Hunter Lab Mini Scan EZ colorimeter 4500 spectrophotometer in D65 illuminant mode with a 10° observer angle, and a 0.5-mm-diameter aperture, on the CIE color space: lightness ( $L^*$ ), redness ( $a^*$ ) and yellowness ( $b^*$ ). Delta-E values ( $\Delta E$ ) were calculated to determine visual perception of color differences by the human eye. Data were analyzed as a 1-way ANOVA for texture and physico-chemical parameters, and a 2-way ANOVA for instrumental color, with dehydration time and d post-production as the fixed effects. The analysis was performed using the GLIMMIX procedure of SAS ver. 9.4 with means separated at  $P \leq 0.05$ . Based on 3PB parameters, samples dehydrated for 7h were the hardest ( $P < 0.0001$ ) and stiffest ( $P < 0.0001$ ). Meanwhile, based on SF, the SP product flexibility was



greatest following 3 or 4 h of dehydration ( $P < 0.0465$ ). The 6h and 7h SP samples were firmer ( $P < 0.0001$ ) and tougher ( $P < 0.0001$ ) than their 3h and 4h counterparts. After samples were stored under the same conditions for 7 d, instrumental color revealed that SP samples dehydrated at 3h were the lightest ( $P < 0.0007$ ), reddest ( $P < 0.0001$ ) and yellowest ( $P < 0.0001$ ). Delta-E values were greatest between d 0 and 1 within all dehydration times, indicating that differences in color were perceptible at a glance ( $2 \leq \Delta E \leq 10$ ). However, when comparing d 0 to 7, SP treats dehydrated for 3h and 4h had the most stable color and the changes observed were not perceptible to human eyes ( $\Delta E \leq 1.0$ ). As expected,  $a_w$  and MC decreased linearly as dehydration time increased and were lowest in the 7h treats ( $P < 0.0001$ ).

Overall, SP can be used to generate color and shelf-stable jerky-style pet treats with varying textural characteristics depending on dehydration time providing value to both the meat and pet food industries. Future work will focus on assessing pet owner preference for SP treats with different textural characteristics.

#### **Biography:**

Hilary Carrera is originally from Panama and obtained her Bachelor of Science degree in Food Science and Technology from Zamorano University in Honduras. She is currently in her second year of a Master of Science degree program at Auburn University in the Department of Poultry Science. Hilary is mentored by Drs. Jessica Starkey and Charles Starkey. Her research focuses on assessing the sensory perception of pet owners regarding jerky-style pet treats made with swine pluck. Hilary actively participates at local and international conferences, presenting data related to the development of pet treat products utilizing co-products from the meat processing industry to fellow scientists and pet food industry stakeholders.