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Intelligence

Phosphates enhance alligator meat products

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Phosphates increase water retention, improve texture and reduce potential for rancidity



Many farms that raise alligators from eggs to adults have become part of the expanding aquaculture industry in Florida, USA. Wild alligators grow about 30 centimeters per year in length, but farm-raised gators – which receive balanced diets in heated buildings – can reach 183 cm in 36 months.

The growing alligator industry needs help in developing new products, especially value-added meat products. Through a United States Department of Agriculture Risk Management Agency grant, the Florida Department of Agriculture and Consumer Services asked the authors to develop marketable meat products using alligator meat.

Preliminary findings

Alligator meat goes through changes after it has been processed. At the onset of rigor, anaerobic metabolism depletes glycogen reserves, accumulation of lactic acid drives pH down to around 5.6, and the ability of protein to bind moisture deteriorates significantly. Approaching post rigor conditions, the pH drops to around 5.3 and more bound moisture is lost. This leads to a dry, stringy product.

In order to have a “winning” alligator meat product, it is necessary to increase the water-holding capacity of the meat. This increase will result in a value-added product with more moistness and tenderness, and consequent better texture.

Processing evaluation

Farm-raised alligator meat was delivered to a meat-processing plant in Canton, Ohio, where experts on meat and poultry processing promptly evaluated it. After sautéing some of the meat with no flavors or seasonings, its texture and tenderness were of concern because the meat was dry and rather tough. This confirmed the authors’ findings.

The goal was to increase the pH of the meat, rehydrate it to prerigor levels, and improve texture. A marinade using salt, broth flavoring, and sodium phosphate with a pH of 9.5 was formulated.

Phosphates improve texture

Phosphates were used because they are beneficial in increasing water retention by raising the pH back to 6-6.4, improving texture and retarding lipid oxidation, which reduces the potential for rancidity. A 15 percent solution was added to the alligator and vacuum tumbled for 18 minutes.

In addition to the marinated gator, “Cajun-style” gator nuggets and sausage, and breaded gator patties were prepared and frozen. Phosphates were also used in the formulation of these products to retain moisture for better texture and meat shear.

“That’s alligator!”

All frozen products were sent to a June 28 workshop at the University of Florida in Gainesville that addressed all aspects of alligator usage, from tanning and manufacturing to meat processing. Most of the work-shop participants were alligator meat “connoisseurs.” When it came time to taste the new creations, the cry of “That’s Alligator!” reverberated through the university auditorium.

The texture and flavor of the marinated gator were well received by the participants. All products were perceived to have good appearance, excellent texture and firmness, as well as great flavor.



Conclusion

There is marketing potential for alligator meat products, but the alligator industry must commit further resources to select the right products for the marketplace. Phosphate treatments will likely increase the market viability of whatever alligator meat products are finally selected.

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