1981

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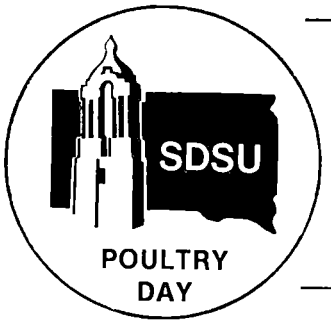

FABRICATION OF STEAKS FROM SPENT HENS

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DEPT. OF ANIMAL SCIENCE REPORT
POULTRY 81-8

Research at SDSU has demonstrated that meat from spent laying hens (spent fowl) can be utilized in the production of fabricated steaks and/or roasts. Previous studies utilized raw meat from carcasses that were manually deboned. Under commercial deboning, meat that has been precooked is more easily separated from the bone. Precooking reduces the ability for meat to hold together or bind in a processed product. Precooked and raw spent fowl muscles were compared as raw material for the production of fabricated steaks. The objective of this research was to produce from precooked spent fowl muscle a palatable restructured product that will withstand handling, cooking and serving.

All products were sliced into flakes by the Urschel comitrol. The flaked meat was shaped into rolls using a combination of pressure and freezing in Experiments 1, 2 and 3. The frozen rolls were cut into steaks 1 inch thick for further evaluation. Chemical analysis, texture and taste panel palatability evaluations were performed on all four experiments. In Experiment 1, four formulations of spent fowl muscle, each made to contain 40% dark muscle and 60% white muscle, were prepared as follows: (1) raw meat, large flake size; (2) raw meat, small flake size; (3) cooked meat, large flake size and (4) cooked meat, small flake size. In the second experiment, spent fowl muscle was flaked and formulated to include (1) 100% raw meat; (2) 80% raw meat and 20% precooked meat; (3) 50% raw meat and 50% precooked meat and (4) 20% raw meat and 80% precooked meat. The effect of a binder was observed in Experiment 3. Spent fowl meat (50% dark/50% white) was flaked and formulated to include (1) no added wheat gluten (control); (2) 1% wheat gluten and (3) 2% wheat gluten. Each formulation was mixed for 5 minutes, half removed and the remainder mixed an additional 10 minutes. In the fourth experiment, patties were prepared from spent fowl meat and contained from 0 to 30% added fat and skin. One-half of each of these treatments was coated with an alignate film, while the other half served as controls.

A large consumer taste panel rated restructured steaks made from raw flakes more desirable in juiciness and overall palatability than

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steaks made from precooked chicken. Table 1 lists average scores for several traits evaluated by the panel. A smaller experienced panel in Experiment 2 indicated similar results. As the percentage of precooked meat was increased, restructured steaks became less tender and overall palatability decreased. Steaks made from precooked fowl had a greater tendency to crumble. Table 2 lists mean values for sensory attributes of restructured steaks having 0, 1 and 2% wheat gluten binder added (Experiment 3). Texture desirability ratings showed a preference for the firmer steaks made with added gluten and mixed for 15 minutes. These steaks were also rated as being more juicy. The addition of 2% wheat gluten adversely affected flavor desirability. In Experiment 4, chicken patties coated with an alignate film were rated as being significantly more juicy and palatable than patties without an alignate coating.

Results of these experiments verify that cooking the spent carcass to facilitate boning has negative effects on the texture of the flaked product. Binders will reduce the negative textural effects of precooking. However, the wheat gluten binder used in Experiment 3 had undesirable flavor effects. Research is underway to evaluate other binders.

Table 1. Mean values for sensory attributes of restructured chicken made from large and small flakes of raw and precooked chicken (Experiment 1)

Formulation	Sensory attributes[a]			
	Texture desirability[b]	Flavor desirability[b]	Juiciness[c]	Overall palatability[b]
Raw:				
Large flake	5.3ef	5.8e	4.4e	5.3ef
Small flake	5.9e	6.0e	4.9e	5.9e
Precooked:				
Large flake	4.8f	5.4e	3.8f	4.8fg
Small flake	4.6f	4.7f	3.3g	4.5g

[a]Means in the same column followed by a common letter are not significantly different ($P<0.05$).
[b]Means based on an 8-point scale (8=like extremely; 1=dislike extremely).
[c]Means based on an 8-point scale (8=extremely juicy; 1=extremely dry).

Table 2. Mean values for sensory attributes of restructured chicken steaks containing 0, 1, and 2% gluten binder (Experiment 3)

Formulation	Mixing time (min)	Sensory attributes[a]			
		Texture desirability[b]	Juiciness[c]	Flavor desirability[b]	Overall palatability[b]
Control	5	5.5ef	3.6f	6.2f	5.6e
Control	15	5.4ef	4.0f	5.6f	5.2ef
1% wheat gluten	5	5.0ef	3.8f	5.8f	5.5e
1% wheat gluten	15	5.8e	5.2e	5.9f	5.8e
2% wheat gluten	5	4.9f	4.0f	4.7e	4.6f
2% wheat gluten	15	5.8e	5.1e	5.4ef	5.6e

[a]Means in the same column followed by a common letter are not different ($P<0.05$).
[b]Means based on an 8-point scale (8=like extremely; 1=dislike extremely).
[c]Means based on an 8-point scale (8=extremely juicy; 1=extremely dry).