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Introduction

Each year the poultry industry is faced with a large number of spent laying hens (spent fowl) which are often difficult to market at a reasonable price. If less desirable poultry carcasses such as spent hens could be utilized economically to create desirable new products, there would be considerable incentive to do so. Because of the maturity level of spent hens, their muscles are quite tough and, therefore, products made from them would have to be comminuted. A new method of comminution, called flaking, cleanly cuts frozen muscle into wafer-thin slices which aids in the binding properties upon further processing. The manufacture of restructured steaks involves, first, the flaking of meat and, secondly, the pressing of meat into a particular shape. The resulting product should be tender yet simulate the actual eating quality of a real steak. The objective of this study was to determine the optimum levels of white and dark meat required in the formulation of restructured steaks and to examine the feasibility of adding skin and fat to these products.

Methods

In Experiment one, spent fowl breast (white) and thigh and drumstick (dark) muscles were used to make restructured steaks. Formulations were as follows: (1) 100% dark meat, (2) 75% dark meat, 25% white meat, (3) 50% dark meat, 50% white meat, (4) 25% dark meat, 75% white meat and (5) 100% white meat. In the second experiment, four formulations of restructured steaks were made to contain a 1 to 1 ratio of white and dark meat and either 0%, 10%, 20% or 30% skin and fat.

Restructured steaks were later cooked and served to a 54-member consumer sensory panel. They were asked to rate each formulation on texture desirability, flavor desirability and overall palatability on an 8-point scale (8 = like extremely; 1 = dislike extremely). In addition, juiciness was rated on an 8-point scale (8 = extremely juicy; 1 = extremely dry).

Results

Sensory attributes of restructured chicken steaks as affected by level of white and dark meat are presented in Table 1. Overall palatability, texture and flavor desirability ratings were highest for restructured steaks containing 50% or more white meat. However, juiciness values were slightly lower as compared to restructured steaks containing 100% dark meat. Although these data suggest that restructured steaks containing 100% white meat are preferred by consumers to restructured steaks made with 100% dark meat, maximum utilization of the spent fowl carcasses would suggest meat mixtures containing at least 60% white meat.

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Sensory attributes of restructured chicken steaks with varying levels of added skin and fat are presented in Table 2. Flavor desirability, juiciness and overall palatability values suggest that the addition of up to 30% added skin and fat did not adversely affect these sensory attributes. However, texture desirability ratings were significantly lower for restructured steaks containing 20% and 30% added skin and fat as compared to restructured steaks containing no skin and fat. These data suggest that up to 10% added skin and fat can be utilized in the manufacture of chicken restructured steaks made from spent fowl carcasses.

Table 1. Sensory evaluation attributes of chicken restructured steaks made with varying levels of white and dark meat

	Sensory attributes[a]			
Type of meat	Texture desirability[b]	Flavor desirability[b]	Juiciness[c]	Overall palatability[b]
100% dark meat	4.9^{f}	5.2^{f}	5.6^{e}	5.1^{f}
75% dark + 25% white	4.9^{f}	5.1^{ef}	5.0^{fg}	4.9^{f}
50% dark + 50% white	5.9^{e}	5.4^{e}	5.3^{ef}	5.5^{e}
25% dark + 75% white	5.7^{e}	5.7^{e}	4.8^{g}	5.6^{e}
100% white meat	5.9^{e}	5.7^{e}	4.9^{g}	6.0^{e}

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

Table 2. Sensory attributes of chicken restructured steaks with varying levels of added skin and fat

	Sensory attributes[a]			
Treatment	Texture desirability[b]	Flavor desirability[b]	Juiciness[c]	Overall palatability[b]
All meat	5.5^{e}	5.7^{e}	5.2^{e}	5.4^{e}
10% added skin and fat	5.2^{ef}	5.7^{e}	5.3^{e}	5.5^{e}
20% added skin and fat	5.0^{f}	5.5^{e}	5.3^{e}	5.4^{e}
30% added skin and fat	4.9^{f}	5.6^{e}	5.2^{e}	5.1^{e}

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