Effect of Ante-Mortem Factors and Slaughtering Conditions on Physical Quality of Commercial Broiler Chicken Carcasses

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The ante-mortem handling and slaughtering conditions influence the final carcass quality of the broiler chicken. Many problems may occur at these stages that potentially increase the rate of carcass downgrading and meat quality. The determination of factors affecting poultry meat quality is a very important issue for the poultry industry to eliminate their possible negative effect on broiler meat quality in order to maximise the profit. The present study was carried out to determine the effect of carcass weight, transportation distance to processing plant and the main machinery used at the processing line on the possible defects of the chicken carcasses.

The current study was carried out at a commercial broiler processing plant at Gampola using Cobb 500 broiler strain. The first experiment was done to investigate the relationships between weight categories and possible carcass quality defects. Two hundred broiler carcasses were selected randomly, weighed, categorised into five distinct weight categories and quality defects recorded. In the second experiment, 40 birds were selected from open type poultry houses located at Gampola, Pupuressa, Galewela and Kajuwatta, separately. Quality defects were recorded considering the transportation distance. The severity of the quality defects was ranked (Acceptable quality: 1, Slightly damaged: 2, Damaged: 3, Severely damaged: 4 and Rejected: 5) by visual observation. Ranked data obtained from experiment I and II were subjected to one way Kruskal-Wallis test. Median values were analysed using Mann-Whitney test. In the third experiment, carcass quality defects were recorded at machinery level of the processing line. The data obtained from each machine were analysed using linear logistic models and the variability was assessed by Proc (PROBIT) in SAS software package.

The carcass weight had a significant effect on the severity of the defects. Lowest carcass weight category (600-1049 g) showed significantly higher severity of wing dislocation, bruises on the breast area and presence of pin feathers. Furthermore, carcass quality defects increased with distance of transportation. The highest percentage of bruises on both wing and breast were showed when transportation distance exceeded 35 km. According to severity evaluation of the damage, the highest transportation distance showed a significantly higher effect on presence of bruises on breast and wing. Considering defects of the machinery at the processing line, the de-feathering process had a significant effect on wing dislocation. Pre-slaughter handling conditions and processing conditions are very essential factors which contribute to carcass and meat quality defects; therefore, these factors should not be overlooked.