Developing Simple and Economical Prototype to Measure the Internal and External Quality Parameters On Poultry Eggs

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Egg quality is based on the characters of an egg that affect its acceptability to the consumer. There are several quality parameters used to identify the quality eggs; both internal and external. Internal quality refers to measuring the egg albumin and yolk distribution and yolk color whereas external quality refers to egg size, weight, shape and shell thickness. According to the quantitative and qualitative parameters there are different grading systems available for measuring quality and classify eggs with different groups and price levels. However, still there is no user friendly and economical method to measure the egg yolk color, shape, weight and shell thickness from a single machine. The study attempts to design a prototype to fill this gap. The egg weight is measured by using load cell which is connected to a liquid crystal display and to the computer. When the egg is placed on the cell the value is displayed both on the computer screen and display. The shell thickness is measured using a digital Vernier caliper. The value is displayed once it is placed between the two arms of the Vernier caliper, which is connected to the computer via an Arduino board. The yolk color and egg shape are measured using image processing techniques. In both processes an RGB image is taken and it is converted to a gray scale image. Then a histogram is developed using the pixel count of each point through length and width. Finally, by analyzing the histogram the output is given. The completed prototype was tested and accuracy was measured. Each feature of the model was accepted by more than 60% of accuracy. After all, a survey was done for testing the user acceptance with the participation of selected 20 poultry farmers, and that accuracy level was appreciated by more than 80% of respondents.

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