Background: Coconut flour has been identified as a promising ingredient in the formulation of functional food products due to its high dietary fiber content but production has not reached commercial operation. One of the reasons for the delay in commercial scale production was that the process parameters were not optimized. Since the Philippines produce an estimate of 35,000 metric tons of coconut residue annually, utilization of this waste product in the production of flour would benefit the country economically and make available an ingredient for functional food product development. Objectives: This study was conducted to evaluate the processing variables affecting the quality of flour produced from coconut meat residue, determine the optimum parameters for the production of flour using response surface methodology and to analyze the physico-chemical properties of the coconut flour produced using optimized parameters. Methods: Fifteen (15) flour samples were processed following the Box-Behnken experimental design. Ten (10) quality parameters were used to determine the effects of three (3) independent variables namely waiting time, blanching time and moisture content before expelling, on the quality of flour produced. The flour samples produced were analyzed for % oil and flour yield, color, fat, moisture, peroxide and sensory quality for color, odor, texture and general acceptability. Results: Waiting time, blanching time and moisture content before expelling significantly affected the color (L value), moisture content, oil yield and sensory properties, namely, color, texture, and general acceptability of the coconut flour. As the blanching time was increased, the flour became lighter in color and hedonic rating scores for color, texture and general acceptability increased. The shorter the waiting time before expelling, the lighter was the color of the flour produced. At extreme values of moisture content before expelling, (2 and 10%) the flour and oil yield was lower as compared to the mid point value of 6%. Using Response Surface Methodology and based on the criteria set for a light colored low-fat, low moisture and generally acceptable coconut flour, the optimum processing parameters were 2.75 hrs waiting time, 9 minutes blanching time and 6% moisture content before expelling. The comparison of the optimized flour to the control showed that there was no significant difference on the protein, carbohydrates and energy content of the two flours. The control flour was lighter in color than the optimized flour so that it was given higher scores in hedonic rating than the optimized flour. Although the fat content of the optimized flour was higher than the control flour, it was still within the requirement for low fat flour which is less than 15% fat content. The dietary fiber content of the optimized flour was slightly higher than the control flour.
**Conclusion/Recommendation:** The optimum processing parameters for the production of flour made from coconut residue are 2.75 hours waiting time, 9 minutes blanching time and 6% moisture content before expelling. Pilot scale production is recommended using these optimized parameters. This will ensure the availability of raw material for functional food products while assisting the food industry utilizing coconut milk, in the management of their waste.