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## Comparative analysis of the critical variables to design and size a spray dryer in the Whey Protein Process: A critical review

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A comparative study to analyze the critical variables to design and size a spray dryer for the whey protein process was investigated. The main objective of this research was to study how the critical and interlinked variables of the spray and atomization process can affect the spray dryer design and its sizing. The first stage of the research was developed to establish the different kinds of models employed in the design of a spray dryer, focusing on the critical variables that influence the spray dryer design. The second stage focused on the analysis of the critical variables to determine how these variables have an influence over the selection of a specific correlation model. The analysis was developed to establish a guide that would allow the designers to select a convenient model depending on the variables available to design a spray dryer. The process was evaluated by the relation between the size of the dimensional responses (diameter, length, and volume) and the economic cost of the spray dryer. The effect of the design variables on the spray dryer models was determined following a dimensional analysis to calculate their impact on the Spray dryer size. The variables used in this study were whey humidity content, inlet and outlet temperatures of air, the air velocity and flow, the whey outlet humidity content, and the residence time. Each model was found to independently show a specific response for only certain variables. This demonstrates the importance of having a conservative design which varies depending on the specifications given by the upper and lower bounds.

### Biography

Anibal Jose Barrios Quant his expertise in food sciences and passion for exercise sciences. He was research assistant on the Department of Nutrition, Food and Exercise Sciences on Florida State University, and worked on whey protein beverages projects, and plant design experimentation on the department of Chemical % Biomedical Engineering of the same university. He sent 2 articles to the Journal of Chemical Engineering, and the Journal of Dairy Technology respectively, to achieve an honor thesis on the Universidad del Atlántico, on Barranquilla, Colombia. he was also an entrepreneur on Unreasonable labs on 2016 and on the DIA program of the OEA.

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