

Project No. S1027
Title: The Poultry Food System: A Farm to Table Model
Period Covered: 08-2005 to 09-2006
Date of Report: 31-Sep-2006
Annual Meeting Dates: 09-Sep-2006

Annual Meeting Site: Verona, Italy
September 9, 2006

Cooperating Station: Department of Food Science
Purdue University
Food Science Building
West Lafayette, IN 47907

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2006 PROGRESS REPORT:

OBJECTIVE 4: Production and Processing Factors Impacting the Safety of Poultry Products

Number 1: Preslaughter Activities

Effect of Testing Temperature on Internal Egg Quality Measurements (Kevin Keener – Purdue, Ken Anderson – NCSU, Pat Curtis – Auburn)

A collaborative study was conducted on quality measurements of shell eggs and determining the effect of testing temperature. The quality measurements compared included three Haugh Unit methods, egg weight, albumen height, albumen width, albumen index, yolk width, yolk height, yolk index, and percent thin albumen at three sampling temperatures of 5°C, 13°C, and 23°C. Samples were taken at time 0 and after seven weeks of storage at 5 °C. Vitelline membrane strength was only measured on the 5°C eggs. Washed and graded USDA, Grade A, Large eggs from Hy-Line W36 and Bovans White laying hens were used. The different internal quality measures resulted in similar determinations of quality between the 5°C and 23°C sampling temperatures. However, increasing testing temperature showed a lower quality ($P < 0.05$) when measured by albumen height, albumen width, albumen index, all Haugh Unit methods, yolk width, yolk height, and yolk index. Coefficient of variation increased for all methods with increasing temperature. There was a proportionately different amount of yolk and albumen detected between the strains, with no significant difference seen in Haugh Units. The evaluated methods for measuring quality appear to result in similar quality determinations for internal egg quality. The electronic QDC Egg Quality System for Haugh Unit calculation resulted in the lowest coefficient of variation. At specific sampling temperatures, the Haugh Unit calculation would provide for the best comparison between experimental treatment variables.

National Egg Products School

The National Egg Products School was held July 31-Aug 3, 2006 in Fayetteville, AR. The school offered training on safety, quality, and manufacturing methods used in producing egg products. Approximately 15 persons attended the four day program. The school is offered on an annual basis with 2007 school being hosted by Auburn University. Presenters in the school included University of Arkansas, Purdue University, Auburn University, Texas A&M, North Carolina State University

WORK PLANNED FOR NEXT YEAR:

OBJECTIVE 4. Production and Processing Factors Impacting the Safety of Poultry Products

Number 1: Packaging:

Eliminating Pathogens in Raw, Packaged, and Ready-to-Eat Poultry Products Using Non Thermal, Atmospheric Plasma (Kevin Keener – Purdue, Brian Sheldon – NCSU, and Paul Dawson – Clemson): NC, SC, and IN will continue investigating the application of non-thermal plasmas for the treatment of surface contamination of poultry products (raw, partially cooked, and fully cooked) and packaging films. Experiments will determine non-thermal plasma's ability to reduce bacterial contamination based on plasma gas composition (nitrogen, oxygen, helium), surface type (skin, muscle, non-food), and type and level of pathogen contamination (*Salmonella*, *Listeria*, *Campylobacter*).

Education:

Continue participating in the planning and implementation of training innovations for the National Egg Products School.

PUBLICATIONS (2006):

A. Journal Articles:

Keener, K. M., K. C. McAvoy, J. B. Foegeding, P. A. Curtis, K. E. Anderson, J. A. Osborne, and D. J. Bush. 2006. Effect of testing temperature on internal egg quality measurements. *Poultry Sci.* 85:550-555.

B. Abstracts:

K.E. McCormick, K.S. Hauser, and K.M. Keener. 2005. Effects of Carbon dioxide and Carbonate on Lysozyme Activity in Chicken Eggs. Abstract T38. Poultry Science Association Annual Meeting. July 31-August 3, 2005. Auburn University. Auburn, AL

C. Books and Book Chapters:

D. Manuscripts Approved:

E. Symposia Presentations:

F. Proceedings:

Keener, K.M. and R. Rosaline. 2006. Egg White Lysozyme Activity in Carbon Dioxide Solutions. In "Proceedings of the EPC2006, XII European Poultry Conference", Verona, Italy, September 10-14, 2006 (on CD).

G. Popular and Trade Publications:

H. Other Research Interest

1. In-shell egg quality measurement
2. Bacterial control in egg and poultry processing –advanced technologies and antimicrobial treatments