VALIDATING LETHALITY FOR PROCESSING DRY FERMENTED MEAT PRODUCTS

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Pond, Barbut, Griffiths et al., J. Food Prot
FERMENTED SAUSAGE:
E. coli 0157:H7 OUTBREAKS

- 1994 - Salami in CA and WA, 20 cases
- 1995 - Mettwurst in S. Australia (0111:NM), 150 cases, 1 child died. 23 HUS*
- 1998 - Genoa Salami in Ontario, 40 cases. 2 HUS

* Hemolytic Uremic Syndrome
DEVELOPING MATHEMATICAL MODELS TO PREDICT GROWTH -- MODEL A

\[ y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_{12} x_1 x_2 + \beta_{22} x_2^2 + \beta_{33} x_3^2 + \eta \]

where: \( y = E. coli \) O157:H7 log reduction in uncooked fermented salami

\( x_1 = a_w \) of uncooked fermented salami

\( x_2 = \text{pH of uncooked fermented salami} \)

\( x_3 = \text{time of processing at specific stages of uncooked fermented salami} \)

\( \beta_0 = \text{estimate for the y intercept} \)

\( \beta_1 x_1 = \text{estimate for the linear effect of independent variable } a_w \)
LINEAR REGRESSION - *E. coli* O157 SURVIVAL IN FERMENTED SAUSAGE (MODEL A)

Observed *E. coli* 0157:H7 (log CFU/g) vs. Predicted *E. coli* 0157:H7 (log CFU/g)

- Equation: \( y = 1.30x + 0.035 \)
- \( R^2 = 0.959 \)

Pond et al., 2001
RESPONSE SURFACE GENERATED FOR MODEL A

Pond et al., 2001
RESPONSE SURFACE GENERATED FOR MODEL B

\[ \text{tarea} = \text{temp/time area} \]