VALIDATING LETHALITY FOR PROCESSING DRY FERMENTED MEAT PRODUCTS

Shai Barbut

University of Guelph

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

$$y = \beta o + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_{12} x_1 x_2 + \beta_{22} x_2^2 + \beta_{33} x_3^2 + \eta_o$$

where: y = *E. coli* O157:H7 log reduction in uncooked fermented salami
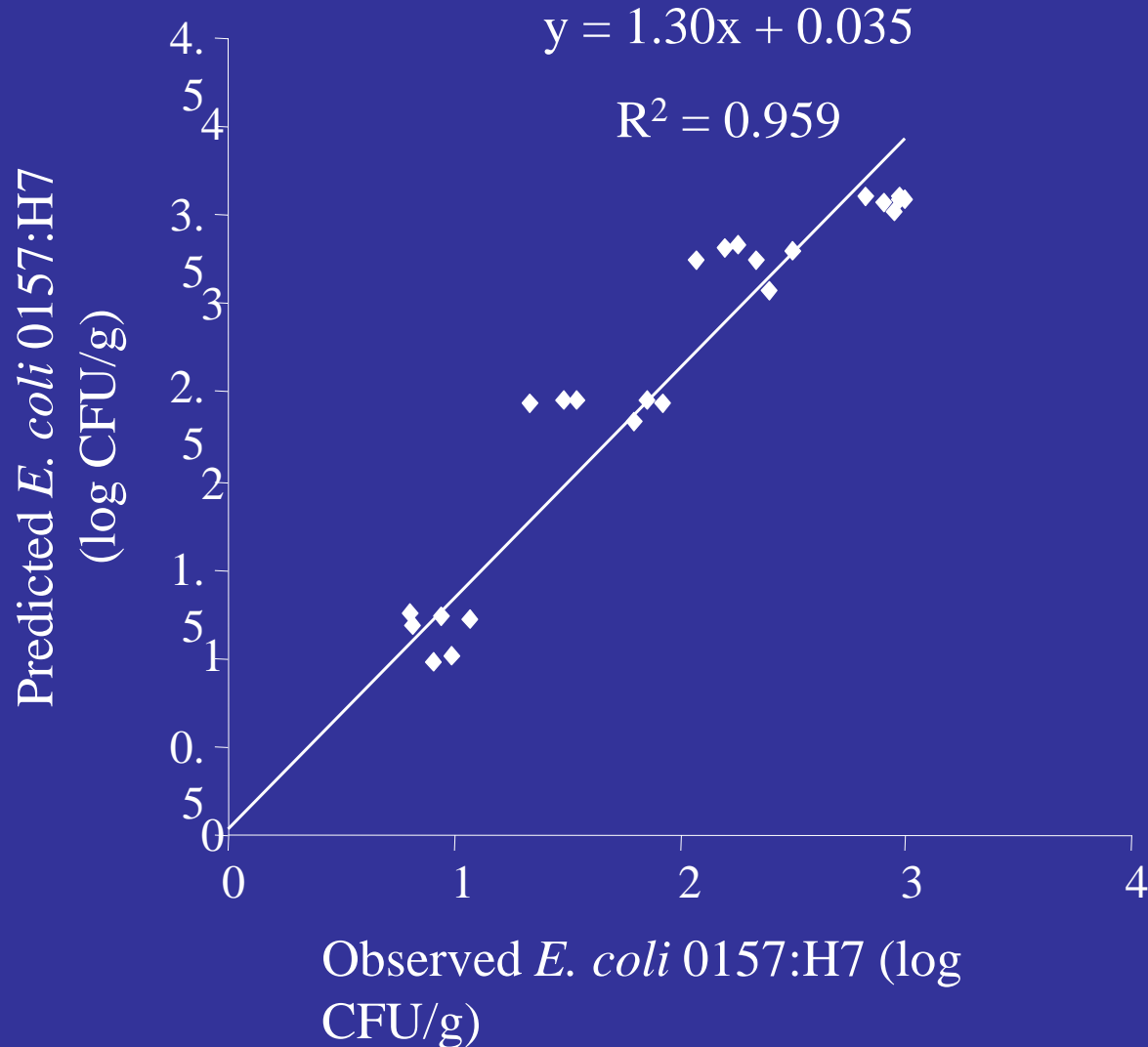
$x_1 = a_w$ of uncooked fermented salami

x_2 = pH of uncooked fermented salami

x_3 = time of processing at specific stages of uncooked fermented   salami
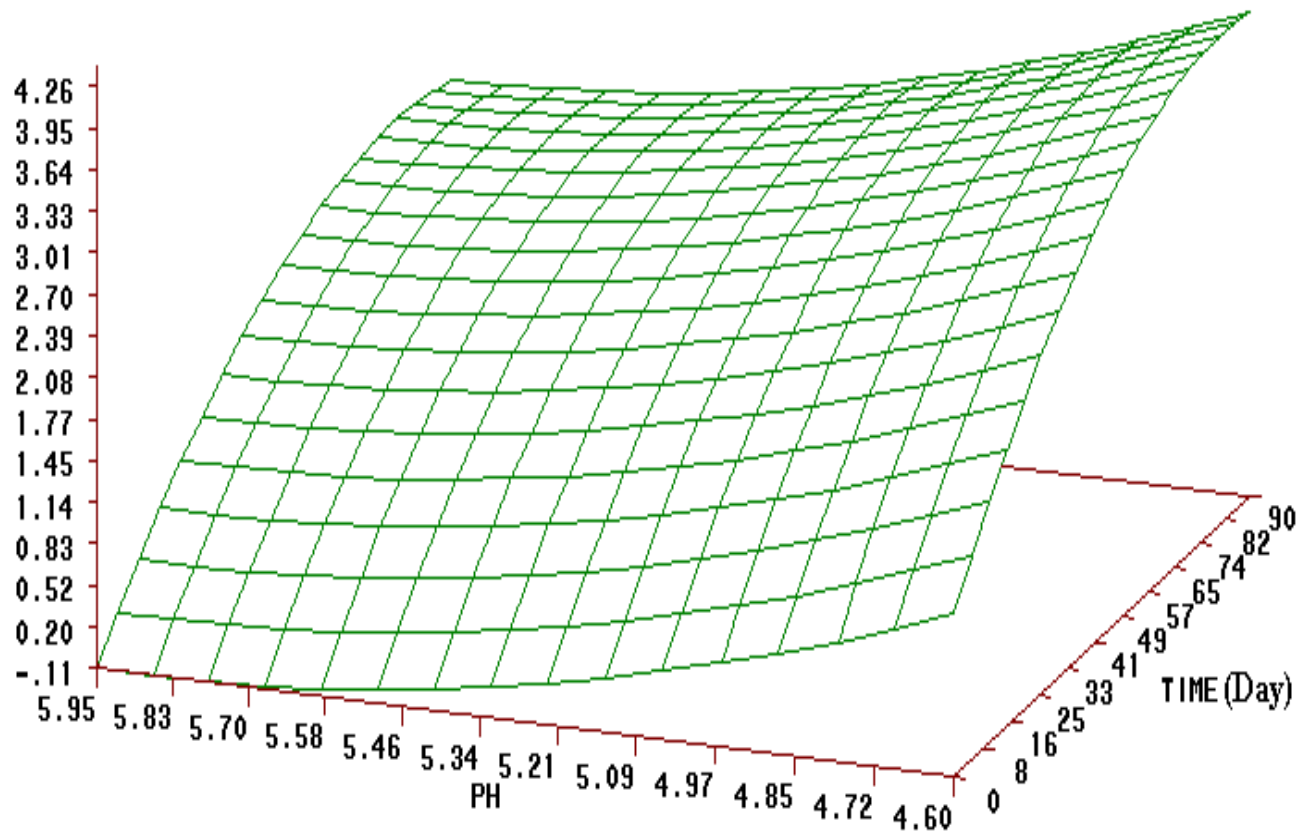
βo = estimate for the y intercept

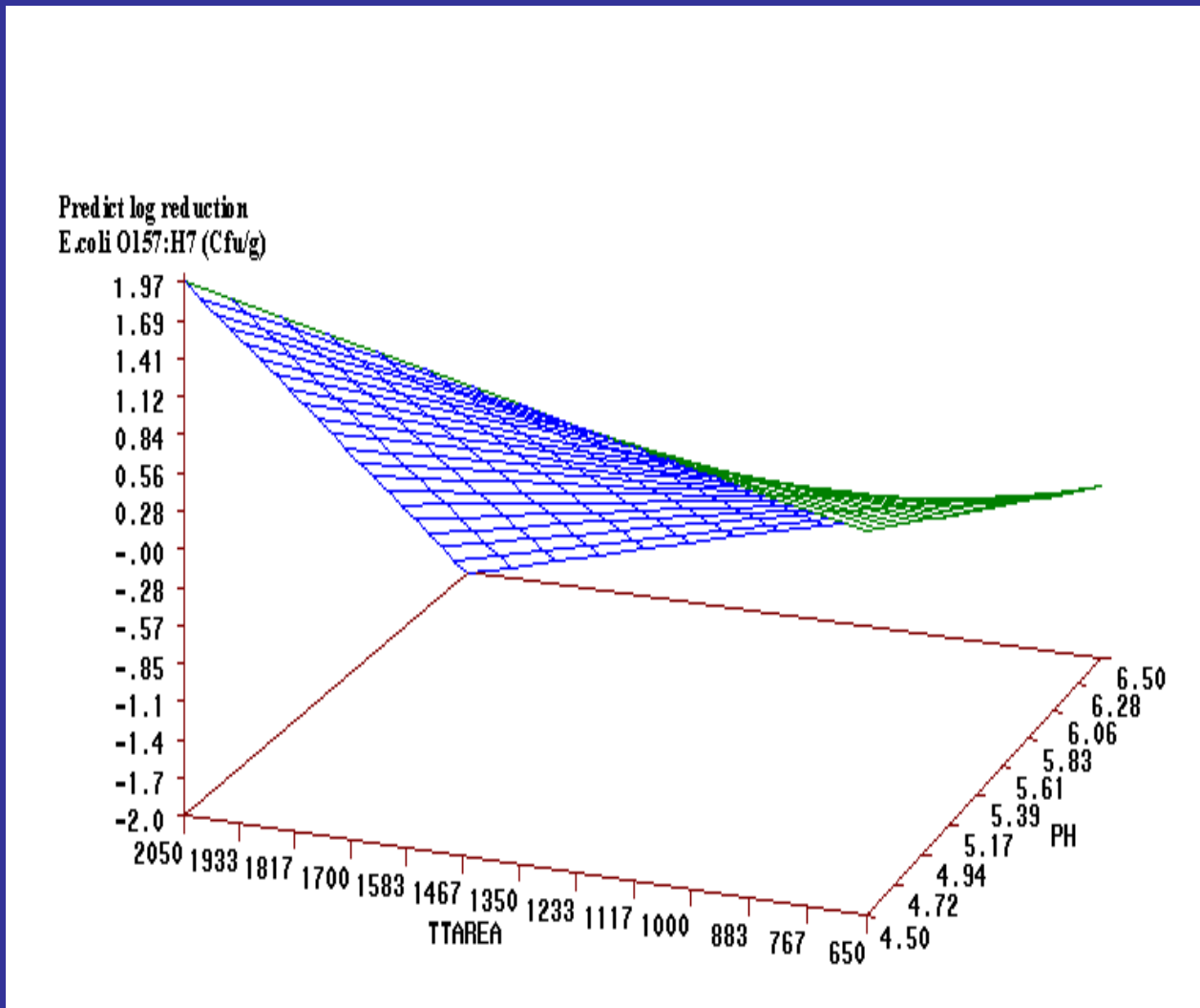$\beta_1 x_1$ = estimate for the linear effect of independent variable a_w

LINEAR REGRESSION - *E. COLI* O157 SURVIVAL IN FERMENTED SAUSAGE (MODEL A)

$y = 1.30x + 0.035$

$R^2 = 0.959$

Predicted *E. coli* O157:H7 (log CFU/g)

Observed *E. coli* O157:H7 (log CFU/g)

Pond et al., 2001

RESPONSE SURFACE GENERATED FOR MODEL A

Pond et al., 2001

RESPONSE SURFACE GENERATED FOR MODEL B

Predict log reduction
E.coli O157:H7 (Cfu/g)

t*tarea* = temp/time
area)

Pond et al., 2001