Logistic Regression Modelling to Predict Growth of Alicyclobacillus Acidoterrestris CRA7152 in Apple Juice

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The frequency table of the `growth` response reveals that we have a semi-balanced dataset, with several more negative examples. Here, the response is categorical, so we are interested in proportions.

We are interested in finding true biologically meaningful differences between sample types.

Table 1: pH

	No Growth	Growth	Sum
3.5	18	0	18
4	12	8	20
5	8	10	18
5.5	10	8	18
Sum	**48**	**26**	**74**

Table 2: Nisin concentration (IU/ml)

	No Growth	Growth	Sum
0	8	14	22
30	12	6	18
50	10	6	16
70	18	0	18
Sum	**48**	**26**	**74**

Table 3: Temperature (°C)

	No Growth	Growth	Sum
25	16	2	18
35	10	8	18
43	10	10	20
50	12	6	18
Sum	**48**	**26**	**74**

Table 4: Soluble solids conc. (°Brix)

	No Growth	Growth	Sum
11	16	8	24
13	8	8	16
15	6	10	16
19	18	0	18
Sum	**48**	**26**	**74**

Table 5: Coefficients of the final model for A. Acidoterrestris growth in apple juice

	Coefficient	P value
(Intercept)	-260.7453	0.0446
ph	43.0019	0.0497
nisin	-1.9031	0.0460
temperature	3.1852	0.0382

Table 6: Confusion matrix summarizing results of applying the logistic regression model on the training data samples

Real label	Predicted label	
	No Growth	Growth
No Growth	48	0
Growth	2	24