

What Broiler Trials Tell Us About Q-Biotic™ *Bacillus Subtilis* Strain and Profitability



Since the 1980s, our scientific understanding and use of direct-fed microbials (probiotics) in feed has progressed significantly. Quality Technology International, Inc. has been offering direct fed microbials (DFM) containing a robust facultative anaerobe bacteria strain *Bacillus subtilis*, for over 2 decades. QTI's DFM products, which include both probiotics and prebiotics, have become widely and successfully used in poultry production. The following is a review of relevant trials to help evaluate the potential use and profitability of Q-Biotic™ 1DP, one of QTI's new DFM products, containing a QTI's proprietary *Bacillus subtilis* strain.

Science-Based Product

The Q-Biotic proprietary *Bacillus subtilis* strain was selected through extensive testing and evaluation. Testing has shown that the Q-Biotic strain does not contain plasmids to develop antibiotic resistance.

Academic research has revealed some of the modes of action of dietary *Bacillus subtilis* spores. Known modes of action include: 1) vegetating within the digesta of the intestinal tract which consumes oxygen making the digesta more anaerobic and favoring the proliferation of native *Lactobacillus* species, 2) synthesizing and releasing a number of important enzymes, 3) improving calcium dynamics in bone (osteoblasts and osteoclasts), and 4) enhancing the immune response of the host for better disease resistance.

In practical terms, these modes of action often translate into improved nutrient digestion, more weight gain, better feed conversion ratio and livability (lower mortality), higher carcass and breast muscle yields, and better profitability. Pen trials have confirmed these benefits.

Trial Results: Broilers

Results of 4 U.S. controlled pen trials conducted on new or recycled litter indicate the productivity of broiler production can be improved by adding Q-Biotic 1DP at an inclusion rate of 500,000 cfu/g to the feed (Figure 1).

Figure 1: Summary (4 Trials) of % Improvements in Broiler Live Performance with Q-Biotic™ 1DP: Adj. FCR & Wt. Gain (% Change vs. Control)



Across all 4 broiler pen trials (Figure 1), the average improvements from feeding diets with Q-Biotic 1DP were 2.4% in body weight gain and 3.8% in feed conversion ratio. The final ages in the 4 U.S. pen trials ranged from 42 to 45 days with an average of 42.75 days.

Economically, return on investment can vary as a function of feed cost/ton, live value or worth per broiler or per unit of weight, and other factors such as feed formulas, broiler genetics, and levels of inclusion.

When using the overall Control vs. Q-Biotic™ 1DP body weight, feed conversion ratio, and mortality % values and assumed feed cost and live broiler value, ROI can be estimated as shown in Table 1. A ROI of approximately 9:1 was calculated using the shown feed cost, live weight value, & Q-Biotic 1DP cost assumptions. As these assumptions change, ROI can change as well.

Table 1: Benefit: Cost Ratio and Return on Investment (ROI) in U.S. Dollars Using 4 Controlled Broiler Chicken Trials and Assumed Broiler Feed Cost per Ton, Broiler Live Production Cost and Q-Biotic™ 1DP

Parameter	Control	Q-Biotic™ 1DP
Chick Placement per Week	1,000,000	1,000,000
Body Weight, Lb.	5.240	5.353
Livability, %	95.1	93.8
Feed Conversion Ratio	1.797	1.728
Total Live Weight, Lb.	4,994,543	5,043,549
Feed Cost, \$/Ton	220.0	221.0
Total Feed, Lb.	8,873,586	8,632,703
Total Feed Cost, \$	976,095	953,914
Live Weight Value, \$/Lb.	0.40	0.40
Total Live Weight Value, \$	1,997,817	2,017,420
Net: (Live Value-Feed Cost), \$	1,021,723	1,063,506
Net: Compared to Control, \$	-	41,783
Total Cost of Additive, \$	-	4,316
Net Value: (Net-Additive Cost), \$	-	37,467
Benefit: Cost Ratio	-	9.7
Return on Investment (ROI)	-	8:7:1

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