241 Stability of commercial phytase products stored under different environmental conditions.

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A 300-d study evaluated the stability of 4 phytase products stored under varied environmental conditions. The 4 products were: 1) Quantum Blue 5G (AB Vista, Marlborough, United Kingdom); 2) Ronozyme HiPhos GT 2700 (DSM Nutritional Products, Parsippany, NJ); 3) Axtra Phy TPT (Dupont, Wilmington, DE); and 4) Microtech 5000 Plus (Guangdong VTR Bio-Tech Co., Ltd., Guangdong, China). Products were stored as pure forms at −20, 4, 22, or 35°C (75% humidity), or in a vitamin or vitamin trace mineral (VTM) premix at 22 and 35°C (75% humidity). Samples were stored in paper bags and sampled on d 30, 60, 90, 120, 210, and 300. Stability was determined as amount of residual phytase activity (% of initial). For pure forms, all interactive and main effects of product, time, and temperature were significant ($P < 0.05$). From d 30 to 300, products had similar reductions in phytase activity at the 3 highest temperatures; however, Quantum Blue 5G, Ronozyme HiPhos GT 2700, and Axtra Phy TPT had reduced ($P < 0.05$) phytase activity compared to Microtech 5000 Plus at −20°C. As storage time increased, residual phytase activity was reduced ($P < 0.05$) regardless of product and storage temperature. Also, when product was stored at 4 and 22°C, phytase activity was improved compared to −20 and 35°C. For vitamin and VTM premixes, a time×temperature × product interaction ($P < 0.05$) was observed as a result of, Axtra Phy TPT and Microtech 5000 Plus having reduced residual phytase activity ($P < 0.05$) compared to the other 2 products when stored at 22°C, while activity of Axtra Phy TPT was reduced ($P < 0.05$) even further than the other 3 products when stored at 35°C regardless of form. From d 30 to 300, Axtra Phy TPT and Microtech 5000 Plus had the lowest ($P < 0.05$) residual phytase activity compared to the other 2 products. The VTM had decreased ($P < 0.05$) residual phytase activity compared to the pure product and vitamin premixes. In conclusion, phytase stored for longer than 90–120 d at 35°C or −20°C in pure form, or when stored as a VTM premix had reduced residual phytase activity.

Key Words: phytase, storage, stability

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Table 241.

	Residual phytase activity, %[1]							
	Sampling, d							Probability, $P <$
Item	30	60	90	120	210	300	SEM	Storage form main effect
Pure product	95.1	96.8	97.2	93.5	90.7	82.0	5.30	0.001
Vitamin premix	106.9	100.8	100.4	96.6	88.3	77.9		
VTM	95.5	58.5	77.2	78.0	54.6	39.0		

[1] Stability was measured as the analyzed phytase concentration divided by d 0 phytase concentration.

242 Effect of a dry acidulant coating on the palatability of dry extruded dog food.

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In the pet food industry, *Salmonella* is getting greater scrutiny because it is considered a "reasonably foreseeable hazard" with the implementation of the Food Safety Modernization Act. Specifically, there is zero tolerance for any serotype of *Salmonella* in pet foods. *Salmonella* contamination was responsible for 78% of the Class I recalls in pet food according to the most recent Reportable Food Registry Report (FDA, 2015). One potential method of *Salmonella* mitigation shown to be effective was through coating the exterior of the kibble with a powdered dry acidulant, such as sodium bisulfate (SBS; Jones-Hamilton, Co.). Sodium bisulfate coating on both dog and cat kibbles was shown to provide complete mitigation of *Salmonella* within 14-d storage (Jeffrey et al., 2014). However, it is thought that the use of dry acidulant with a palatant for coating kibble may negatively impact palatability of a dry dog food. Therefore, the objective of this experiment was to determine if the use of a dry acidulant, SBS, would influence the palatability of a dry dog food. A single dry extruded all life stages dog food was collected from a commercial pet food manufacturer before the coating step. The kibble was coated with either 2.2% spray dried chicken liver + 0.2% SBS or 2.2% spray dried chicken liver + 0.2% powdered silica (control). A total of 20 beagles were used in a standard 2-bowl forced choice palatability test method for 2 d. Dogs were fed 400 g of both diets once per day, with bowls rotated daily to address side bias. Results were analyzed using the GLIMMIX procedure of SAS (Cary, NC). The inclusion of SBS did not affect daily preference of diet ($P = 0.23$). Furthermore, there was no effect of day ($P = 0.18$) or the interaction of treatment × day ($P = 0.98$). These results demonstrate that palatability is not affected by the inclusion of SBS with a palatant in the coating of dog food kibble. Considering that the inclusion of SBS has been shown to be effective at mitigating *Salmonella* in pet food and no negative effects on palatability were observed, the use of a dry acidulant in a dog food coating gives the industry a promising method to control *Salmonella* contamination of finished dog foods.

Key Words: dog food, palatability, *Salmonella*

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