Effect of Irradiation on Microbiological Activity of Grain-based and Purified Diets Manufactured by LabDiet® or TestDiet® (2015).

Multiple samples were collected from two different grain-based diets and three purified diets. Table 4 shows pre-irradiation and post-irradiation values for these samples including the lowest and highest values recorded in each category. All samples were below detectable limits post irradiation.

Table 4. Effect of irradiation on microbiological activity of grain-based and purified diets manufactured by LabDiet® or TestDiet®.

Microbiological Values	Grain		Purified	
	Pre-Irradiation (Range)	Post-Irradiation	Pre-Irradiation (Range)	Post-Irradiation
Aerobic plate count, CFU[1]/g	10-8600	BDL[2]	10-340	BDL
Coliforms, MPN[3]	BDL-3.6	BDL	BDL	BDL
Enterobacteriaceae spp., MPN	BDL	BDL	BDL	BDL
Escherichia coli, CFU/g	BDL	BDL	BDL	BDL
Fecal Coliforms, MPN	BDL-3.6	BDL	BDL	BDL
Yeast Count, CFU/g	BDL-65	BDL	BDL-10	BDL
Mold Count, CFU/g	BDL-60	BDL	BDL	BDL

[1] CFU = Colony Forming Units
[2] BDL = Below Detectable Level. Detectable levels are: 10 CFU/g for aerobic plate count, E. coli, yeast count, and mold count; 3 MPN for coliforms, EB, and fecal coliforms
[3] Most Probable Number

The American Food and Drug Administration (FDA) regulates the acceptable level of radiation used in animal feeds to 10-50 kGy (FDA, 2012). Many studies show irradiation of different feeds at these levels is effective in eliminating bacterial and fungal presence in the feed (Chen et al., 2000; Lee et al., 2012). Commonly measured parameters include aerobic plate counts, coliforms, fecal coliforms, yeast, mold, *Enterobacteriaceae spp*., and *Escherichia coli*. Effectiveness of irradiation on viruses has not been adequately studied. As predicted by previous studies irradiation at levels between 10-50 kGy resulted in both grain-based and purified diets have no detectable levels for aerobic plate count, coliforms, fecal coliforms, yeast, mold, *Eterobacteriaceae spp.*, and *Escherichia coli*.

Food and Drug Administration. 21 CFR § 579.40. 2012

Chen, Q, Y. Ha, and Z. Chen. 2000. A study on radiation sterilization of SPF animal feed. Radiation Physics and Chemistry. 57: 329-330.

Lee, J.Y., S.B. Cho, Y.Y. Kim, and S.J. Ohh. 2012. Effect of gamma irradiation and autoclaving on sterilization and amino acids digestibility of diets for specific pathogen free mini-pigs containing either soybean meal or whey protein. Livestock Science. 149: 201-207.