COVANCE
THE DEVELOPMENT SERVICES COMPANY

3301 Kinsman Boulevard
Madison, WI 53704

Print Date: 19-May-2009 8:22:02AM

Report Date: 19-May-2009

Report Number: 104186-0

Certificate of Analysis

Final Report

National Institutes of Health

BLDG 14A, RM 119A8
Bethesda Maryland 20892 United States

Client Sample Name:	**Zebra Fish Diet 0409**	**Covance Sample Number:**	**186729**
Project ID	NAT_INST-20090504-0006	**Receipt Date**	04-May-2009
PO Number	Charge - AMEX	**Login Date**	04-May-2009
		Storage Condition	-20 (+/- 10) Degrees Celsius
		Number Composited	1
		Disposal Instructions	Dispose 60 days after final reported

Analysis/Result	Result
Choline	
Choline	3130 ppm
Fat	
Fat	17.3 %
Crude Fiber	
Crude Fiber	0.7 %
Protein (N x 6.25) Dumas Method	
Protein	53.7 %
Vitamin A	
Vitamin A	25700 IU/kg
Vitamin D	
Vitamin D	7620 IU/kg
Vitamin D2	<200 IU/kg
Vitamin E	
Vitamin E	477 IU/kg
Thiamin	
Thiamin	43.2 ppm
Riboflavin	
Riboflavin	141 ppm
Niacin	
Niacin	694 ppm
Pyridoxine Hydrochloride	
Pyridoxine Hydrochloride	74.9 ppm
Folic Acid	
Folic Acid	11.9 ppm
Vitamin B12	
Vitamin B12	168 mcg/kg
Biotin	
Biotin	1.26 ppm
Pantothenic Acid	
Pantothenic Acid	212 ppm
Iodine	
Iodine	2.89 ppm
Selenium	

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Analysis/Result	Result
Selenium	
Selenium	2.48 ppm
Elements by ICP Emission Spectrometry	
Calcium	2.39 %
Copper	66.6 ppm
Iron	252 ppm
Magnesium	0.167 %
Manganese	75.5 ppm
Phosphorus	1.59 %
Potassium	0.606 %
Sodium	0.517 %
Zinc	119 ppm
Ash	
Ash	9.52 %
Moisture	
Moisture	4.4 %
L-ascorbyl-2-phosphate	
L-ascorbyl-2-phosphate	805 ppm
Clostridium perfringens	
Clostridium Perfingens	<10 CFU/g
Escherichia coli Count	
Escherichia Coli	<10 CFU/g
Salmonella BAM (Rapid method)	
Salmonella	Negative /25 g
Yeast and Mold Count	
Yeast Count	<10 CFU/g
Mold Count	<10 CFU/g

Signed on Behalf of Covance

Doug Winters
Laboratory Director

For questions on this report, please contact your Client Service Representative

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Method References	Testing Location

Ash (ASHM_S:3) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL (2005) 18th Ed., AOAC INTERNATIONAL, Gaithersburg, MD, USA, Official Method 923.03.

Biotin (BIOM_S:11) — **Covance Laboratories Inc.**

Scheiner, J. and De Ritter, "Biotin Content of Feedstuffs," Journal of Agricultural Food Chemistry, 23(6):1157-1162 (1975). (Modified)

Wright and Skeggs, Procedures of the Society of Experimental Biology and Medicine, 56:95, (1944). (Modified)

Methods of Analysis for Infant Formulas, Infant Formula Council, (1985). (Modified)
Journal of the AOAC, 49:882, (1996). (Modified)

Choline (COL4_S:7) — **Covance Laboratories Inc.**

Clostridium perfringens (CLOS:2) — **Covance Laboratories Inc.**

1. Compendium of Methods for the Microbiological Examination of Foods. Clostridium perfringens, 4th Edition, Chapter 34, 2001. American Public Health Association: Washington D.C. Modified.
2. Bacteriological Analytical Manual, Clostridum perfringens, Chapter 16, 2001 Food and Drug Administration, AOAC International: Gaithersburg, Maryland. Modified.
3. Clostridium perfringes in Foods: AOAC Official Method 976.30, Official Method of Analysis of the AOAC International, 18th Edition, 2005. Gaitherburg, Maryland. Modified.

Crude Fiber (CFIB_S:2) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL (2005) 18th Ed., AOAC INTERNATIONAL, Gaithersburg, MD, USA, Official Method 962.09.

Elements by ICP Emission Spectrometry (ICP_S:11) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL, (2005) 18th ED., AOAC INTERNATIONAL Gaithersburg, MD, USA, Official Methods 984.27, 985.01.

Escherichia coli Count (COLC:4) — **Covance Laboratories Inc.**

Compendium of Methods for the Microbiological Examination of Foods, Colony Count Methods, 4th Edition, Chapter 6,7, American Public Health Association: Washington, D.C. (2001). Modified.

Fat (FAAH_S:5) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 922.06 and 954.02, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005).

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Method References	Testing Location

Folic Acid (FOAN_S:11) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 960.46 and 992.05, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005).

Methods of Analysis for Infant Formulas, Infant Formula Council, Atlanta, GA, Section C-2, (1985).

Iodine (IOL_S:3) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL (2000) 17th ED., AOAC INTERNATIONAL, Gaithersburg, MD, USA, Official Method 932.21. (Modified)

Binnerts, W.T., Analytical Chemistry, 10:78, (1954). (Modified)

Heerspink, W., Op Deweegh, G.J., Clinical Chimica Acta, 39:327-338, (1971). (Modified)

L-ascorbyl-2-phosphate (A2P_S:1) — **Covance Laboratories Inc.**

Moisture (M100T100_S:3) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 925.09 and 926.08, AOAC INTERNATIONAL, Gaithersburg, MD, USA,(2005).

Niacin (NIAP_S:11) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Method 944.13 and 960.46, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005)

Pantothenic Acid (PANN_S:10) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 945.74 and 960.46, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005)

Protein (N x 6.25) Dumas Method (DGEN_S:3) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 968.06 and 992.15, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005).

Pyridoxine Hydrochloride (B6A_S:11) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Method 961.15, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005).

Atkins, L., Schultz, A. S., Williams, W. L., and Frey, C. N., "Yeast Micro-biological Methods for Determination of Vitamins," Industrial and Engineering Chemistry, Analytical Edition, 15:141-144, (1943).

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Method References	Testing Location

Riboflavin (B2FV_S:9) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 940.33 and 960.46, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005).

The United States Pharmacopeia, 29th Ed., p. 1913, United States Pharmacopeial Convention, Inc.: Rockville, Maryland (2005).

Salmonella BAM (Rapid method) (SARM:2) — **Covance Laboratories Inc.**

1. Bacteriological Analytical Manual, Salmonella, Chapter 5, 8th Edition, 2006. Food and Drug Administration, AOAC International: Gaithersburg, Maryland. Modified.
2. Compendium of Methods for the Microbiological Examination of Foods, Salmonella, Chapter 37, 4th Edition, 2001. American Public Health Association. Washington D.C. Modified.
3. Salmonella in Foods, AOAC Official Method 990.13, DNA hybridization Method. Official Methods of Analysis of the AOAC International, 18th Edition, 2005. Gaithersburg, Maryland. Modified.

Selenium (SEHG_S:4) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Method 986.15, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005).

Thiamin (BIDE_S:6) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 942.23, 953.17, and 957.17, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005).

Vitamin A (AFD1_S:4) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 974.29, 992.04, and 992.06, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005).

Thompson, J.N., and Duval, S., "Determination of Vitamin A in Milk and Infant Formula by HPLC", Journal of Micronutrient Analysis, 6:147-159, (1989).

Vitamin B12 (B12F_S:11) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 952.20 and 960.46, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005).

The United States Pharmacopeia, 29th Ed., pp. 603-4, United States Pharmacopeial Convention, Inc.: Rockville, Maryland (2005).

Methods of Analysis for Infant Formulas, Infant Formula Council, Atlanta, Georgia, Section C-2, (1985).

Vitamin D (DFD1_S:7) — **Covance Laboratories Inc.**

Official Methods of Analysis of AOAC INTERNATIONAL (2000) 17th Ed., AOAC INTERNATIONAL, Gaithersburg, MD, USA, Official Method 982.29.

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Method References

Testing Location

Vitamin E (EFD1_S:3) — **Covance Laboratories Inc.**

Cort, W. M., Vincente, T. S., Waysek, E. H., and Williams, B. D., Journal of [Agricultural Food Chemistry, 31:1330-1333 (1983). (Modified)

Speek, A. J., Schijver, J., and Schreurs, W. H. P., Journal of Food Science, 50:121-124 (1985). (Modified)

McMurray, C. H., Blanchflower, W. J., and Rice, D. A., Journal of the Association of Official Analytical Chemists, 63: 1258-1261 (1980).

Yeast and Mold Count (YMCM:4) — **Covance Laboratories Inc.**

1. Bacteriological Analytical Manual, Yeasts, Molds and Mycotoxins. Chapter 18, 8th Edition, 2001. Food and Drug Administration, AOAC International: Gaithersburg, Maryland. Modified.

2. Compendium of Methods for the Microbiological Examination of Foods, Yeasts and Molds, Chapter 20, 4th Edition, 2001. American Public Health Association, Washington D.C. Modified.

3. Yeast and Mold Counts in Foods, AOAC Official Method 997.02. Dry Rehydratable Film Method (Petrifilm). Official Methods of Analysis of the AOAC International, 18th Edition, 2005. Gaithersburg, Maryland. Modified.

Testing Location(s)

Covance Laboratories Inc.
3301 Kinsman Blvd
Madison WI 53704
608-241-4471