United States Department of the Interior

FISH AND WILDLIFE SERVICE

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Memorandum

To: National Fish Hatchery Managers, Pacific and Pacific Southwest Regions

From: Ronald Twibell and Ann Gannam, Fish Nutritionists, Abernathy Fish Technology Center

Subject: Fish feed quality control report for the first quarter of FY 2019

During the first quarter of FY 2019, the Applied Nutrition Program at Abernathy Fish Technology Center (AFTC) analyzed 15 diets as part of the Pacific and Pacific Southwest Region's Fish Feed Quality Control (FFQC) Program. The diet samples were received from 13 Pacific and Pacific Southwest Regions' National Fish Hatcheries (NFHs; Table 1). Each sample was analyzed for moisture and ash by AFTC and for protein, lipid and rancidity by Eurofins Inc. Rancidity analysis includes the measurement of peroxide value and free fatty acids (FFA).

Quality control results are presented in Table 2. The analyzed protein concentrations of Bio Vita Fry 2.0 mm from Quinault NFH, Aqua 100 medicated 2.0 mm from Warm Springs NFH and Bio Clark's Fry 2.0 mm from Willard NFH were lower than the manufacturer's (Bio Oregon) minimum specifications. Protein concentrations of two of these feeds (Bio Vita Fry 2.0 mm from Quinault NFH and Bio Clark's Fry 2.0 mm from Willard NFH) were within the accepted range of analytical variation for the respective feeds whereas the medicated feed from Warm Springs NFH was not. The feed manufacturer was informed of this finding. Lipid concentrations in six of the diet samples (Classic Fry 2.5 mm from Coleman NFH, Classic Fry 2.5 mm from Dworshak NFH, Bio Vita Starter #2 cr. from Dworshak NFH, Bio Vita Starter #0 from Livingston-Stone NFH and Bio Vita Starter #2 from Livingston-Stone NFH) were lower than the manufactures' minimum specifications but within the accepted range of analytical variation.

Fresh oil should have a FFA level at or below 3% and a peroxide value in the range of 3-10 meq/kg oil. Rancidity analysis indicated the FFA levels in most samples were at or above the fresh oil level of 3% (Table 2). The analyzed FFA values ranged from 0.7 to 7.3% and were within the typical range observed in previous feed samples submitted to AFTC. The analyzed peroxide values ranged from 2.4 to 8.9 meq/kg oil (Table 2).

Table 1. Fish feeds received for quality control analysis at Abernathy Fish Technology Center (AFTC) during the first quarter of FY 2019.

Facility	Date Received at AFTC	Manufacturer	Manufacture Date	Sample Description
Coleman NFH	11/26/18	Skretting, USA	08/15/18	Classic Fry, 2X vitamins, 2.5 mm, lot 5399047
Dworshak NFH	10/23/18	Skretting, USA	08/10/18	Classic Fry 2.5 mm, lot 5372804
Dworshak NFH	10/23/18	Bio Oregon	02/28/18	Bio Vita Starter #2 cr., lot 4639518
Eagle Creek NFH	12/10/18	Bio Oregon	10/15/18	Bio Clark's Fry 2.0 mm, lot 5585410
Entiat NFH	11/27/18	Bio Oregon	08/23/18	Bio Pro 2, 2.0 mm, lot 5404433
Kooskia NFH	12/07/18	Bio Oregon	10/13/18	Bio Vita Fry 2.0 mm, lot 5649526
Lahontan NFH	11/26/18	Skretting, USA	08/29/18	Oncor Fry 2.0 mm, lot 5409463
Little White Salmon NFH	11/29/18	Bio Oregon	08/23/18	Bio Clark's Fry 2.0 mm, lot 5404466
Livingston-Stone NFH	10/10/18	Bio Oregon	09/18/18	Bio Vita Starter #0 cr., lot 5458921
Livingston-Stone NFH	12/07/18	Bio Oregon	10/18/18	Bio Vita Starter #2 cr., lot 5568142
Quilcene NFH	11/15/18	Bio Oregon	08/31/18	Bio Clark's Fry 2.0 mm, lot 5424996
Quinault NFH	11/21/18	Bio Oregon	09/25/18	Bio Vita Fry 2.0 mm, lot 5511554
Warm Springs NFH	11/15/18	Bio Oregon	10/19/18	Aqua 100 medicated 2.0 mm., lot 5667502
Willard NFH	11/09/18	Bio Oregon	09/26/18	Bio Clark's Fry 2.0 mm., lot 5511578

Table 1 continued.

Winthrop NFH	11/19/18	Bio Oregon	10/15/18	Bio Clark's Fry 2.5 mm, lot 5585435

Table 2. Quality control results for fish feeds received at Abernathy Fish Technology Center during the first quarter of FY 2019.

										Rancidity	
		Analyzed Proximate Composition				Manufacturers' Specifications[1]				Peroxide	Free fatty
Facility	Diet	Protein	Lipid	Ash	Moisture	Protein	Lipid	Ash	Moisture	value	acids
			%				%			Meq/kg oil	%
Coleman NFH	Classic Fry 2.5 mm	47.5	15.6	8.4	8.9	45.0	16.0	12.0	9.0	4.2	5.0
Dworshak NFH	Classic Fry 2.5 mm	46.5	15.0	7.8	8.9	45.0	16.0	12.0	9.0	4.5	4.8
Dworshak NFH	Bio Vita Starter #2 cr.	55.3	19.5	9.7	5.9	52.0	20.0	12.0	8.5	2.4	4.4
Eagle Creek NFH	Bio Clark's Fry 2.0 mm	49.3	22.8	7.1	6.5	47.0	18.0	12.0	8.5	4.8	3.4
Entiat NFH	Bio Pro 2, 2.0 mm	53.3	21.8	9.2	5.1	50.0	22.0	13.0	8.5	8.9	4.3
Kooskia NFH	Bio Vita Fry 2.0 mm	51.2	24.6	7.9	6.8	50.0	22.0	13.0	8.5	5.8	7.3
Lahontan NFH	Oncor Fry 2.0 mm	49.6	18.6	7.8	7.6	46.0	18.0	10.0	9.0	2.9	7.3
Little White Salmon NFH	Bio Clark's Fry 2.0 mm	47.4	21.9	7.4	5.8	47.0	18.0	13.0	8.5	5.5	5.9
Livingston-Stone NFH	Bio Vita Starter #0 cr.	55.1	17.5	9.6	6.2	53.0	18.0	12.0	8.5	4.5	4.6
Livingston-Stone NFH	Bio Vita Starter #2 cr.	54.1	19.4	9.1	6.3	52.0	20.0	12.0	8.5	7.1	0.7
Quilcene NFH	Bio Clark's Fry 2.0 mm	48.9	21.8	6.7	6.3	47.0	18.0	13.0	8.5	6.3	5.0
Quinault NFH	Bio Vita Fry 2.0 mm	48.8	24.7	8.7	6.9	50.0	22.0	13.0	8.5	5.4	3.3

Table 2 continued.

Warm Springs NFH	Aqua 100 med. 2.0 mm	48.3	23.9	8.5	5.9	50.0	22.0	13.0	8.5	2.8	3.6
Willard NFH	Bio Clark's Fry 2.0 mm	46.9	22.4	7.8	7.8	47.0	18.0	13.0	8.5	3.3	4.8
Winthrop NFH	Bio Clark's Fry 2.5 mm	47.4	22.3	7.0	7.4	47.0	18.0	13.0	8.5	3.6	3.0

[1]Protein and lipid specifications represent minimum allowed concentrations whereas ash and moisture specifications represent maximum allowed concentrations.