

APPENDICES

Table I.1. Levene's test of homogeneity of variances of growth and deposition parameters in cobia from experiment I (Df., degree of freedom; *n-1*).

<i>Parameters</i>	<i>Df.</i>	<i>F-value</i>	<i>P-value</i>
Initial body weight (BW1)	2	1.27	0.29
Initial standard length (SL1)	2	0.47	0.63
End standard length (SL2)	2	0.00	1.00
End body weight (BW2)	2	1.90	0.16
Specific growth rate (SGR)	2	3.13	0.12
Condition factor (CF)	2	2.01	0.14
Viscerosomatic index (VSI)	2	2.42	0.10
Hepatosomatic index (HSI)	2	1.11	0.34
Wet weigh gain (ΔG)	2	3.52	0.10
Protein efficiency ratio (PER)	2	3.46	0.10
Feed conversion ratio (FCR)	2	2.46	0.17
Protein gain	2	4.07	0.06
Lipid gain	2	0.97	0.43
Protein productive value (PPV)	2	2.70	0.15
Liver lipid	2	1.54	0.29
Muscle lipid	2	0.55	0.60
Muscle protein	2	1.30	0.34
Body lipid	2	0.95	0.44
Body protein	2	0.80	0.49

Table I.2. ANOVA table for growth and deposition parameters in cobia from experiment I.

<i>Parameters</i>	<i>Df.</i>	<i>F-value</i>	<i>P-value</i>
Initial body weight (BW1)	2	2.26	0.19
Initial standard length (SL1)	2	0.26	0.78
End standard length (SL2)	2	14.89	<0.01
End body weight (BW2)	2	24.27	<0.01
Specific growth rate (SGR)	2	13.93	<0.05
Condition factor (CF)	2	2.36	0.18
Viscerosomatic index (VSI)	2	0.19	0.83
Hepatosomatic index (HSI)	2	0.75	0.51
Wet weigh gain (ΔG)	2	13.53	<0.05
Protein efficiency ratio (PER)	2	1.57	0.28
Feed conversion ratio (FCR)	2	14.57	<0.01
Protein gain	2	17.19	<0.01
Lipid gain	2	17.40	<0.01
Protein productive value (PPV)	2	2.14	0.20
Liver lipid	2	6.18	<0.05
Muscle lipid	2	1.72	0.26
Muscle protein	2	0.15	0.86
Body lipid	2	13.20	<0.05
Body protein	2	0.08	0.93

Table I.3. Multiple comparisons of growth and depositions in cobia from experiment I (Tukey's test; see Table I.1 for abbreviations).

<i>Parameters</i>	<i>Diet</i>	<i>vs</i>	<i>Diet</i>	<i>P value</i>
SL2	CD1		CD2	<0.01
			BL/A (L/A, 1.1)	0.06
	CD2		BL/A (L/A, 1.1)	0.11
BW2	CD1		CD2	<0.01
			BL/A (L/A, 1.1)	<0.05
	CD2		BL/A (L/A, 1.1)	0.10
SGR	CD1		CD2	<0.01
			BL/A (L/A, 1.1)	<0.05
	CD2		BL/A (L/A, 1.1)	0.18
ΔG	CD1		CD2	<0.01
			BL/A (L/A, 1.1)	0.06
	CD2		BL/A (L/A, 1.1)	0.15
FCR	CD1		CD2	<0.01
			BL/A (L/A, 1.1)	<0.05
	CD2		BL/A (L/A, 1.1)	0.34
Protein gain	CD1		CD2	<0.01
			BL/A (L/A, 1.1)	<0.05
	CD2		BL/A (L/A, 1.1)	0.10
Lipid gain	CD1		CD2	<0.05
			BL/A (L/A, 1.1)	0.86
	CD2		BL/A (L/A, 1.1)	<0.01
Liver lipid	CD1		CD2	0.99
			BL/A (L/A, 1.1)	<0.05
	CD2		BL/A (L/A, 1.1)	0.06
Body lipid	CD1		CD2	0.22
			BL/A (L/A, 1.1)	<0.05
	CD2		BL/A (L/A, 1.1)	<0.05

Table I.4. Levene's test of homogeneity of variances of plasma free amino acid (FAA) in cobia from experiment I

<i>Plasma FAA</i>	<i>Df.</i>	<i>F-value</i>	<i>P-value</i>
Aspartic acid	2	1.03	0.41
Threonine	2	4.50	0.06
Serine	2	2.41	0.17
Asparagine	2	1.51	0.30
Glutamic acid	2	1.89	0.23
Glutamine	2	2.40	0.17
Proline	2	4.82	0.06
Glycine	2	0.97	0.43
Alanine	2	3.08	0.12
Valine	2	3.30	0.11
Methionine	2	4.25	0.07
Isoleucine	2	0.75	0.51
Leucine	2	0.77	0.50
Tyrosine	2	0.68	0.54
Phenylalanine	2	3.05	0.12
Lysine	2	1.10	0.39
Histidine	2	1.44	0.31
Tryptophan	2	1.18	0.37
Arginine	2	2.20	0.19
SumAA	2	2.56	0.16
IAA	2	0.69	0.54
DAA	2	2.23	0.19
IAA/DAA	2	2.70	0.15

Table I.5. ANOVA table for plasma free amino acid (FAA) in cobia from experiment I

<i>Plasma FAA</i>	<i>Df.</i>	<i>F-value</i>	<i>P-value</i>
Aspartic acid	2	1.49	0.30
Threonine	2	3.61	0.09
Serine	2	0.63	0.57
Asparagine	2	1.53	0.29
Glutamic acid	2	1.28	0.34
Glutamine	2	0.10	0.91
Proline	2	1.38	0.32
Glycine	2	0.32	0.74
Alanine	2	1.87	0.23
Valine	2	0.02	0.98
Methionine	2	2.48	0.16
Isoleucine	2	0.68	0.54
Leucine	2	0.05	0.95
Tyrosine	2	0.09	0.91
Phenylalanine	2	0.57	0.59
Lysine	2	0.03	0.97
Histidine	2	0.04	0.96
Tryptophan	2	3.66	0.09
Arginine	2	1.03	0.41
Total AA	2	0.86	0.47
IAA	2	1.80	0.24
DAA	2	0.53	0.61
IAA/DAA	2	1.89	0.23
Lysine to arginine ratio	2	2.77	0.14

Table II.1. Levene's test of homogeneity of variances of growth and deposition parameters in cobia from experiment I.

<i>Parameter</i>	<i>Df.</i>	<i>F-value</i>	<i>P-value</i>
Initial standard length (SL1)	3	2.83	0.11
Initial body weigh (BW1)	3	1.89	0.21
End standard length (SL2)	3	0.80	0.53
End body weigh (BW2)	3	2.31	0.15
CF	3	2.49	0.13
VSI	3	7.13	<0.05
HSI	3	3.16	0.09
SGR	3	4.00	0.07
FCR	3	2.33	0.15
ΔG	3	3.28	0.08
PER	3	2.86	0.10
Protein gain	3	0.82	0.52
Lipid gain	3	1.14	0.39
PPV	3	1.47	0.29
Liver lipid	3	2.38	0.15
Muscle lipid	3	1.77	0.23
Muscle protein	3	0.22	0.88
Body protein	3	0.42	0.74
Body lipid	3	0.74	0.56
Daily feed intake	3	1.15	0.39

Table II.2. ANOVA table for growth and deposition parameters in cobia from experiment II.
 (") Welch test was applied.

<i>Parameter</i>	<i>Df.</i>	<i>F-value</i>	<i>P-value</i>
SL1	3	0.37	0.78
BW1	3	3.69	0.06
SL2	3	16.77	<0.01
BW2	3	29.97	<0.01
CF	3	3.69	0.06
VSI	3	1.81	0.11")
HSI	3	7.78	<0.05
SGR	3	23.68	<0.01
FCR	3	16.11	<0.01
ΔG	3	27.91	<0.01
PER	3	13.75	<0.01
Protein gain	3	30.00	<0.01
Lipid gain	3	103.68	<0.01
PPV	3	4.27	<0.05
Liver lipid	3	18.52	<0.01
Muscle lipid	3	3.60	0.06
Muscle protein	3	4.78	<0.05
Body protein	3	3.05	0.09
Body lipid	3	18.98	<0.01
Daily feed intake	3	8.48	<0.05

Table II.3. Multiple comparisons of growth and depositions in cobia from experiment II (Tukey's tests)

<i>Parameter (A)</i>	<i>Diet (B)</i>	<i>vs</i>	<i>Diet (C)</i>	<i>P-value (D)</i>	
SL2	CD2		BLA (L/A; 1.1)	1.00	
			HL/A (L/A;1.8)	<0.05	
			LL/A (L/A; 0.8)	<0.01	
	BLA (L/A; 1.1)		HL/A (L/A;1.8)	<0.05	
			LL/A (L/A; 0.8)	<0.01	
			LL/A (L/A; 0.8)	0.98	
	BW2	CD2		BLA (L/A; 1.1)	0.31
				HL/A (L/A;1.8)	<0.01
				LL/A (L/A; 0.8)	<0.01
BLA (L/A; 1.1)			HL/A (L/A;1.8)	<0.05	
			LL/A (L/A; 0.8)	<0.01	
			LL/A (L/A; 0.8)	0.51	
HSI		CD2		BLA (L/A; 1.1)	0.21
				HL/A (L/A;1.8)	0.42
				LL/A (L/A; 0.8)	0.19
	BLA (L/A; 1.1)		HL/A (L/A;1.8)	<0.05	
			LL/A (L/A; 0.8)	<0.05	
			LL/A (L/A; 0.8)	0.92	
	SGR	CD2		BLA (L/A; 1.1)	0.31
				HL/A (L/A;1.8)	<0.01
				LL/A (L/A; 0.8)	<0.01
BLA (L/A; 1.1)			HL/A (L/A;1.8)	<0.05	
			LL/A (L/A; 0.8)	<0.01	
			LL/A (L/A; 0.8)	0.40	

Table II.3. (cont'd) Multiple comparisons of growth and depositions in cobia from experiment II (Tukey's test).

<i>(A)</i>	<i>(B)</i>	<i>vs</i>	<i>(C)</i>	<i>(D)</i>	
FCR	CD2		BLA (L/A; 1.1)	0.25	
			HL/A (L/A;1.8)	<0.05	
			LL/A (L/A; 0.8)	<0.01	
		BLA (L/A; 1.1)		HL/A (L/A;1.8)	0.57
				LL/A (L/A; 0.8)	<0.05
			HL/A (L/A;1.8)	LL/A (L/A; 0.8)	<0.05
	ΔG	CD2		BLA (L/A; 1.1)	0.17
				HL/A (L/A;1.8)	<0.01
				LL/A (L/A; 0.8)	<0.01
		BLA (L/A; 1.1)		HL/A (L/A;1.8)	<0.05
				LL/A (L/A; 0.8)	<0.01
			HL/A (L/A;1.8)	LL/A (L/A; 0.8)	0.42
PER		CD2		BLA (L/A; 1.1)	1.00
				HL/A (L/A;1.8)	0.52
				LL/A (L/A; 0.8)	<0.01
		BLA (L/A; 1.1)		HL/A (L/A;1.8)	0.52
				LL/A (L/A; 0.8)	<0.01
			HL/A (L/A;1.8)	LL/A (L/A; 0.8)	<0.05
	Protein gain	CD2		BLA (L/A; 1.1)	0.06
				HL/A (L/A;1.8)	<0.01
				LL/A (L/A; 0.8)	<0.01
		BLA (L/A; 1.1)		HL/A (L/A;1.8)	<0.05
				LL/A (L/A; 0.8)	<0.01
			HL/A (L/A;1.8)	LL/A (L/A; 0.8)	0.84

Table II.3. (cont'd) Multiple comparisons of growth and depositions in cobia from experiment II (Tukey's test).

<i>(A)</i>	<i>(B)</i>	<i>vs</i>	<i>(C)</i>	<i>(D)</i>	
Lipid gain	CD2		BLA (L/A; 1.1)	<0.01	
			HL/A (L/A;1.8)	<0.01	
			LL/A (L/A; 0.8)	<0.01	
	BLA (L/A; 1.1)		HL/A (L/A;1.8)	<0.05	
			LL/A (L/A; 0.8)	<0.05	
		HL/A (L/A;1.8)	LL/A (L/A; 0.8)	0.99	
	PPV	CD2		BLA (L/A; 1.1)	0.74
				HL/A (L/A;1.8)	0.46
				LL/A (L/A; 0.8)	<0.05
BLA (L/A; 1.1)			HL/A (L/A;1.8)	0.95	
			LL/A (L/A; 0.8)	0.14	
		HL/A (L/A;1.8)	LL/A (L/A; 0.8)	0.29	
Liver lipid		CD2		BLA (L/A; 1.1)	<0.05
				HL/A (L/A;1.8)	<0.01
				LL/A (L/A; 0.8)	<0.01
	BLA (L/A; 1.1)		HL/A (L/A;1.8)	0.29	
			LL/A (L/A; 0.8)	0.41	
		HL/A (L/A;1.8)	LL/A (L/A; 0.8)	0.99	
	Muscle protein	CD2		BLA (L/A; 1.1)	0.07
				HL/A (L/A;1.8)	0.06
				LL/A (L/A; 0.8)	<0.05
BLA (L/A; 1.1)			HL/A (L/A;1.8)	1.00	
			LL/A (L/A; 0.8)	0.98	
		HL/A (L/A;1.8)	LL/A (L/A; 0.8)	0.99	

Table II.3. (cont'd) Multiple comparisons of growth and depositions in cobia from experiment II (Tukey's test).

<i>(A)</i>	<i>(B)</i>	<i>vs</i>	<i>(C)</i>	<i>(D)</i>
Body lipid	CD2		BLA (L/A; 1.1)	<0.01
			HL/A (L/A;1.8)	<0.01
			LL/A (L/A; 0.8)	<0.01
	BLA (L/A; 1.1)		HL/A (L/A;1.8)	0.97
			LL/A (L/A; 0.8)	0.75
	HL/A (L/A;1.8)		LL/A (L/A; 0.8)	0.51
Daily feed intake	CD2		BLA (L/A; 1.1)	1.00
			HL/A (L/A;1.8)	<0.05
			LL/A (L/A; 0.8)	<0.05
	BLA (L/A; 1.1)		HL/A (L/A;1.8)	<0.05
			LL/A (L/A; 0.8)	<0.05
	HL/A (L/A;1.8)		LL/A (L/A; 0.8)	0.98

Table II.4. Levene's test of homogeneity of variances of plasma free amino acid (FAA) in cobia from experiment II

<i>Plasma FAA</i>	<i>Df.</i>	<i>F-value</i>	<i>P-value</i>
Aspartic acid	3	2.09	0.20
Threonine	3	1.33	0.35
Serine	3	2.48	0.16
Asparagine	3	1.86	0.24
Glutamic acid	3	1.70	0.27
Glutamine	3	0.78	0.55
Proline	3	4.03	0.06
Glycine	3	1.42	0.33
Alanine	3	3.54	0.09
Valine	3	3.42	0.08
Methionine	3	0.57	0.65
Isoleucine	3	4.00	0.07
Leucine	3	2.73	0.14
Tyrosine	3	4.10	0.06
Phenylalanine	3	4.20	0.06
Lysine	3	4.01	0.06
Histidine	3	3.19	0.08
Tryptophan	3	0.75	0.56
Arginine	3	4.06	0.06
SumAA	3	2.53	0.15
IAA	3	1.12	0.41
DAA	3	0.65	0.61
IAA/DAA	3	1.09	0.42
Lysine to agrinine (L/A)	3	0.99	0.45

Table II.5. ANOVA table for plasma free amino acid (FAA) in cobia from experiment II

<i>Plasma FAA</i>	<i>Df.</i>	<i>F-value</i>	<i>P-value</i>
Aspartic acid	3	2.99	0.12
Threonine	3	0.08	0.97
Serine	3	0.64	0.62
Asparagine	3	0.73	0.57
Glutamic acid	3	0.81	0.53
Glutamine	3	0.68	0.59
Proline	3	0.40	0.76
Glycine	3	0.35	0.79
Alanine	3	1.05	0.44
Valine	3	0.16	0.92
Methionine	3	0.41	0.75
Isoleucine	3	0.18	0.91
Leucine	3	0.15	0.92
Tyrosine	3	2.94	0.12
Phenylalanine	3	1.66	0.27
Lysine	3	1.87	0.23
Histidine	3	0.25	0.86
Tryptophan	3	3.89	0.07
Arginine	3	2.23	0.19
SumAA	3	0.72	0.58
IAA	3	0.31	0.82
DAA	3	0.58	0.65
IAA/DAA	3	0.45	0.73
Lysine to arginine ratio	3	2.27	0.18

Table III.1. Levene's test of homogeneity of variances of growth and deposition parameters in cobia from experiment III.

<i>Parameter</i>	<i>Df.</i>	<i>F-value</i>	<i>P-value</i>
Initial standard length (SL)	3	1.84	0.22
Initial body weight (BW)	3	1.06	0.42
Standard length week 1 (SL1)	3	2.11	0.18
Body weight week 1 (BW1)	3	1.34	0.33
End standard length week 6 (SL6)	3	1.54	0.28
Body weight week 6 (BW6)	3	0.74	0.56
VSI	3	3.01	0.09
HSI	3	0.87	0.50
Daily feed intake	3	1.58	0.27

Table III.2. ANOVA table of growth and depositions in cobia from experiment III.

<i>Parameter</i>	<i>Df.</i>	<i>F-value</i>	<i>P-value</i>
Initial standard length (SL)	3	1.05	0.42
Initial body weight (BW)	3	0.35	0.79
Standard length week 1 (SL1)	3	5.62	<0.05
Body weight week 1 (BW1)	3	4.54	<0.05
End standard length week 6 (SL6)	3	14.90	<0.01
Body weight week 6 (BW6)	3	18.18	<0.01
VSI	3	2.58	0.13
HSI	3	1.71	0.24
Daily feed intake	3	10.59	<0.01

Table III.3. Multiple comparisons of growth and depositions in cobia from experiment III (Tukey's tests).

<i>Parameter</i>	<i>Diet</i>	<i>vs</i>	<i>Diet</i>	<i>P-value</i>
Standard length week 1	CD2		BL/A	0.06
			HL/A	<0.05
			LL/A	<0.05
	BL/A		HL/A	0.99
			LL/A	0.99
	HL/A		LL/A	1.00
Body weight week 1	CD2		BL/A	0.08
			HL/A	0.23
			LL/A	<0.05
	BL/A		HL/A	0.84
			LL/A	0.95
	HL/A		LL/A	0.57
Standard length week 6	CD2		BL/A	0.06
			HL/A	<0.01
			LL/A	<0.01
	BL/A		HL/A	0.15
			LL/A	0.10
	HL/A		LL/A	0.99
Body weight week 6	CD2		BL/A	0.28
			HL/A	<0.01
			LL/A	<0.01
	BL/A		HL/A	<0.05
			LL/A	<0.05
	HL/A		LL/A	0.89
Daily feed intake	CD2		BL/A	0.47
			HL/A	<0.05
			LL/A	<0.05
	BL/A		HL/A	0.08
			LL/A	<0.05
	HL/A		LL/A	0.97

Table III.4. Levene’s test of homogeneity of variances of stomach filling, and brain expression of *npv* and *cck* pre-feeding and post-feeding cobia different diet from experiment III. Ln(MNE), natural logarithm of mean normalized expression.

<i>Dependent variable</i>	<i>F-value</i>	<i>P-value</i>
Stomach filling	2.02	0.12
Ln(MNE) of brain <i>npv</i> week 1	2.63	0.06
Ln(MNE) of brain <i>npv</i> week 6	2.03	0.11
Ln(MNE) of brain <i>cck</i> week 1	1.72	0.17
Ln(MNE) of brain <i>cck</i> week 6	2.58	0.07

Table III.5. Two-way ANOVA table of the stomach filling (0 h after a meal) in cobia fed different diets (CD2, LL/A, BL/A and HL/A) and time sampling (week 1 and week 6) from experiment III. Feeding status, pre-feeding or post-feeding cobia.

<i>Parameter</i>	<i>Source</i>	<i>F-value</i>	<i>P-value</i>
Stomach filling	Week	66.13	<0.01
	Diet	8.22	<0.01
	Week * Diet	0.31	0.82
Ln(MNE) of <i>npy</i> week 1	Diet	0.24	0.87
	Feeding status	26.01	<0.01
	Diet * Feeding status	0.53	0.67
Ln(MNE) of <i>npy</i> week 6	Diet	0.42	0.74
	Feeding status	35.06	<0.01
	Diet * Feeding status	0.20	0.90
Ln(MNE) of <i>cck</i> week 1	Diet	1.09	0.38
	Feeding status	1.01	0.33
	Diet * Feeding status	0.01	1.00
Ln(MNE) of <i>cck</i> week 6	Diet	0.91	0.46
	Feeding status	0.89	0.36
	Diet * Feeding status	0.00	1.00

Table III.5. Pairwise comparisons of the stomach filling (0 h after a meal) in cobia fed different diets (CD2, LL/A, BL/A and HL/A) and time sampling (week 1 and week 6) from experiment III. Cobia at week 6 had higher stomach filling than that at week 1 in all diets.

<i>Week</i>	<i>Diet</i>	<i>vs</i>	<i>Diet</i>	<i>P-value</i>
Week 1	CD2		BL/A	0.08
			HL/A	0.06
			LL/A	<0.01
	BL/A		HL/A	0.24
			LL/A	0.20
	HL/A		LL/A	0.93
Week 6	CT		BL/A	0.28
			HL/A	0.17
			LL/A	0.12
	BL/A		HL/A	0.89
			LL/A	0.48
	HL/A		LL/A	0.57

Table III.6. Pairwise comparisons of the expression of brain *npv* in cobia pre-feeding versus 15- minutes after a meal with different diets (CD2, LL/A, BL/A and HL/A) and time sampling (week 1 and week 6) from experiment III.

Week	Diet	F-value	P-value
Week 1	LL/A	3.37	0.08
	HL/A	5.39	<0.05
	BL/A	6.15	<0.05
	CT	12.70	<0.01
Week 6	LL/A	7.09	<0.05
	HL/A	6.45	<0.05
	BL/A	9.80	<0.01
	CT	12.32	<0.01