

TABLE OF CONTENTS

1.	INTRODUCTION	1
2.	LITERATURE REVIEW	3
2.1	Determination of energy requirements, utilization and dietary supply to fish	3
2.1.1	Dietary sources of energy	3
2.1.2	Measurement of energy metabolism	4
2.1.3	Methods to measure digestibility	5
2.1.4	Branchial and urinary (non-faecal) losses	6
2.1.5	Measurement of heat production: fish calorimetry	6
2.1.6	Comparative carcass analyses	7
2.1.7	Metabolizable energy	8
2.1.8	Growth and energy retention	8
2.1.9	Energy requirement for maintenance	8
3.	MATERIALS AND METHODS	13
3.1	Experimental facility	13
3.2	Experimental animals	16
3.3	Experimental procedure	17
3.4	Diets and feeding	18
3.4.1	Experimental diets	18
3.4.2	Feeding system	18
3.5	Sample preparation and chemical analysis	20
3.5.1	Sample preparation	20

3.5.1.1	Preparation of feed samples	20
3.5.1.2	Preparation of faeces samples	20
3.5.1.3	Preparation of whole body samples	21
3.5.2	Laboratory analyses	21
3.6	Data analyses	22
3.7	Statistical analyses	23
4.	RESULTS	26
4.1	Documentation of primary measurements	26
4.1.1	Feed analyses	26
4.1.2	Faecal sample analyses	27
4.1.3	Performance	27
4.1.4	Whole body homogenates	27
4.2	Growth, Energy and Nitrogen balances of trout in the 4 experiments	27
4.2.1	Experiment 1	27
4.2.2	Experiment 2	34
4.2.3	Experiment 3	36
4.2.4	Experiment 4	38
5.	DISCUSSION	42
5.1	Mortality	42
5.2	Interpretation of primary measurements	43
5.3	Performance	43
5.4	Accretion of lipids and protein	44
5.4.1	Experiment 1	44
5.4.2	Experiment 2	44

5.4.3	Experiment 3	46
5.4.4	Experiment 4	46
5.5	Energy balances	47
5.6	Comparison with other studies	54
5.7	Nitrogen balance	62
6.	CONCLUSIONS	69
6.1	Conclusions	69
6.2	Recommendations	71
7.	SUMMARY	73
8.	APPENDIX	75
9.	REFERENCES	90