

CONTENTS	PAGE NO
1.0. GENERAL INTRODUCTION	1
2.0. GENERAL MATERIALS AND METHODS	5
2.1. Experimental animal	5
2.2. Rearing the fish	5
2.3. Size groups	6
2.4. Experimental diet /feed	6
3.0. LENGTH – WEIGHT RELATIONSHIP	8
3.1. Introduction	8
3.2. Materials and methods	11
3.3. Results and discussion	13
4.0. NUTRITION AND BIOENERGETICS	17
4.1. Introduction	17
4.2. Materials and methods	22
4.2.1. Effect of protein density on energy budget	22
4.2.2. Effect of rations on energy budget	23
4.2.3. Energy estimation	23
4.2.3.1. Wet combustion method	
4.2.4. Energy budget calculation	
4.3. Results	27
4.3.1. Effect of protein density	27
4.3.2. Effect of ration	30
4.4. Discussion	31
5.0. RESPIRATORY METABOLISM	40
5.1. Introduction	40
5.2. Materials and methods	45
5.2.1. Experimental design	45
5.2.2. Design of closed type respirometer	45
5.2.3. Oxygen consumption and partial pressure of oxygen	46
5.2.4. Design of open flow respirometer	47
5.2.4a. Routine- and standard metabolism and diurnal variation	48
5.3. Results	48
5.3.1. Effect of p_{O_2} on the rate of oxygen consumption	48

5.3.2. Effect of density on the rate of oxygen consumption	49
5.3.3. Effect of temperature on the rate of oxygen consumption	49
5.3.4. Asphyxial time	50
5.3.5. Routine metabolism and post pirandial oxygen consumption	50
5.3.6. Standard metabolism	51
5.4. Discussion	51
6.0. HISTOLOGY AND HISTOPATHOLOGY	57
6.1. Introduction	57
6.2. Materials and methods	62
6.2.1. Physiochemical characteristics of well water	62
6.2.2. Determination of LC ₅₀	63
6.2.3. LC ₅₀ values	64
6.2.4. Experimental design	65
6.2.5. Preparation of permanent microscopic slides	66
6.2.5.1. Tissue processing	66
6.2.5.2. Staining	67
6.2.5.2a. Ehrlich's hematoxylin and Eosin Y	67
6.2.5.2b. Van Gieson with methylene blue	67
6.3. RESULTS	68
6.3.1. Gills	68
6.3.1.1. Histology of normal gills	69
6.3.1.2. Histopathological changes in gills exposed to Fenvalerate and recovery	71
6.3.1.3. Histopathological changes in gills exposed to Endosulfan and recovery	72
6.3.2. Liver	72
6.3.2.1. Histology of normal liver	72
6.3.2.2. Histopathological changes in liver exposed to Fenvalerate and recovery	73
6.3.2.3. Histopathological changes in liver exposed to Endosulfan and recovery	74
6.3.3. Stomach	76
6.3.3.1. Histology of normal stomach	76
6.3.3.2. Histopathological changes in stomach exposed to	

Fenvalerate and recovery	77
6.3.3.3. Histopathological changes in stomach exposed to Endosulfan and recovery	78
6.3.4. Intestine	80
6.3.4.1. Histology of normal intestine	80
6.3.4.2. Histopathological changes in intestine exposed to Fenvalerate and recovery	80
6.3.4.3. Histopathological changes in intestine exposed to Endosulfan and recovery	81
6.3.5. Kidney	82
6.3.5.1. Histology of normal kidney	82
6.3.5.2. Histopathological changes in kidney exposed to Fenvalerate and recovery	83
6.3.5.3. Histopathological changes in kidney exposed to Endosulfan and recovery	84
6.3.6. Ovary	86
6.3.6.1. Histology of normal ovary	86
6.3.6.2. Histopathological changes in ovary exposed to Fenvalerate and recovery	87
6.3.6.3. Histopathological changes in ovary exposed to Endosulfan and recovery	88
6.4. Discussion	89
7.0. KARYOLOGY	106
7.1. Introduction	106
7.2. Materials and methods	110
7.2.1. Preparing the karyotype from metaphase	111
7.3. Results	112
7.4. Discussion	113
SUMMARY	
APPENDIX	
REFERENCES	