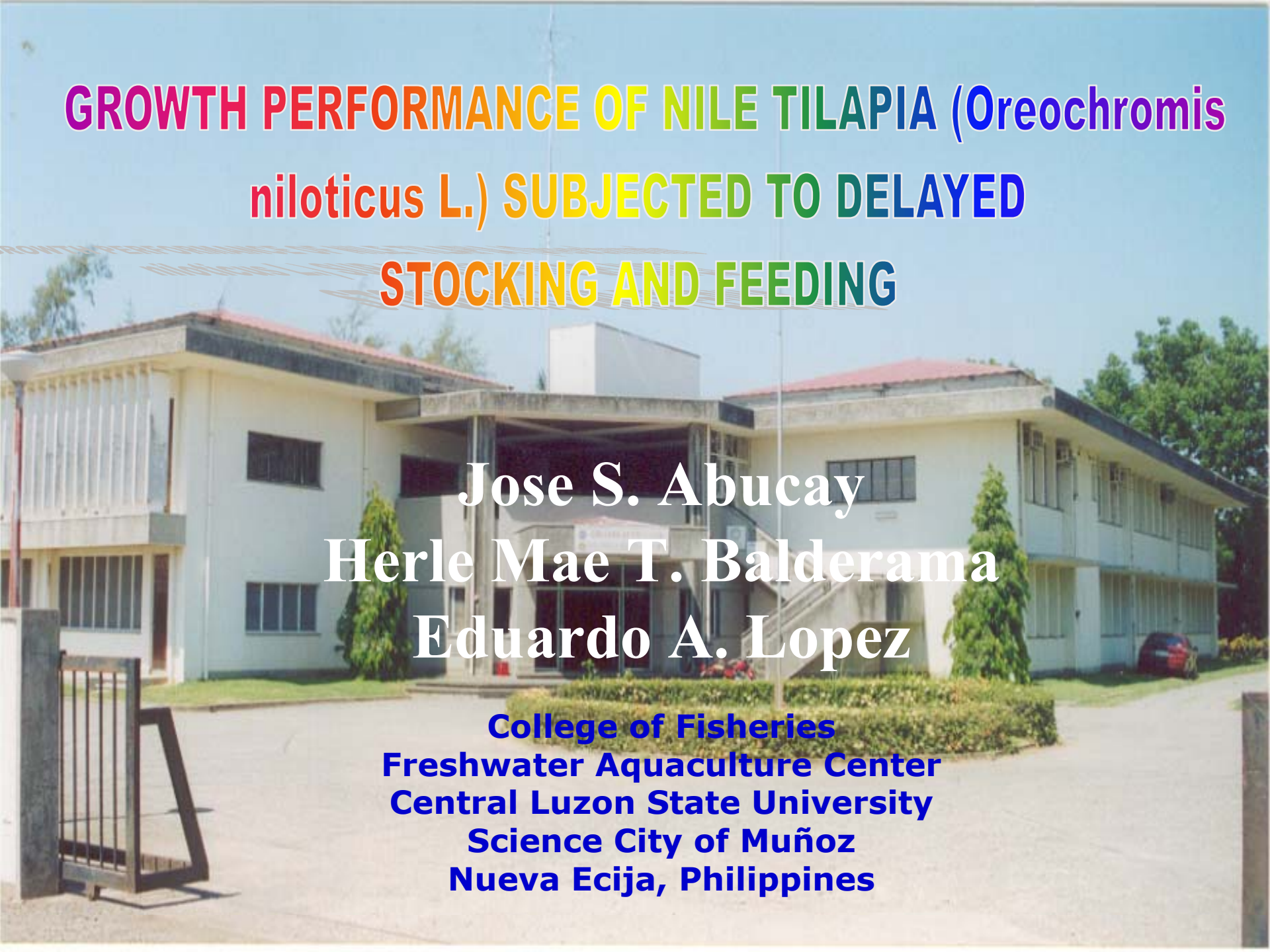
GROWTH PERFORMANCE OF NILE TILAPIA (Oreochromis niloticus L.) SUBJECTED TO DELAYED STOCKING AND FEEDING



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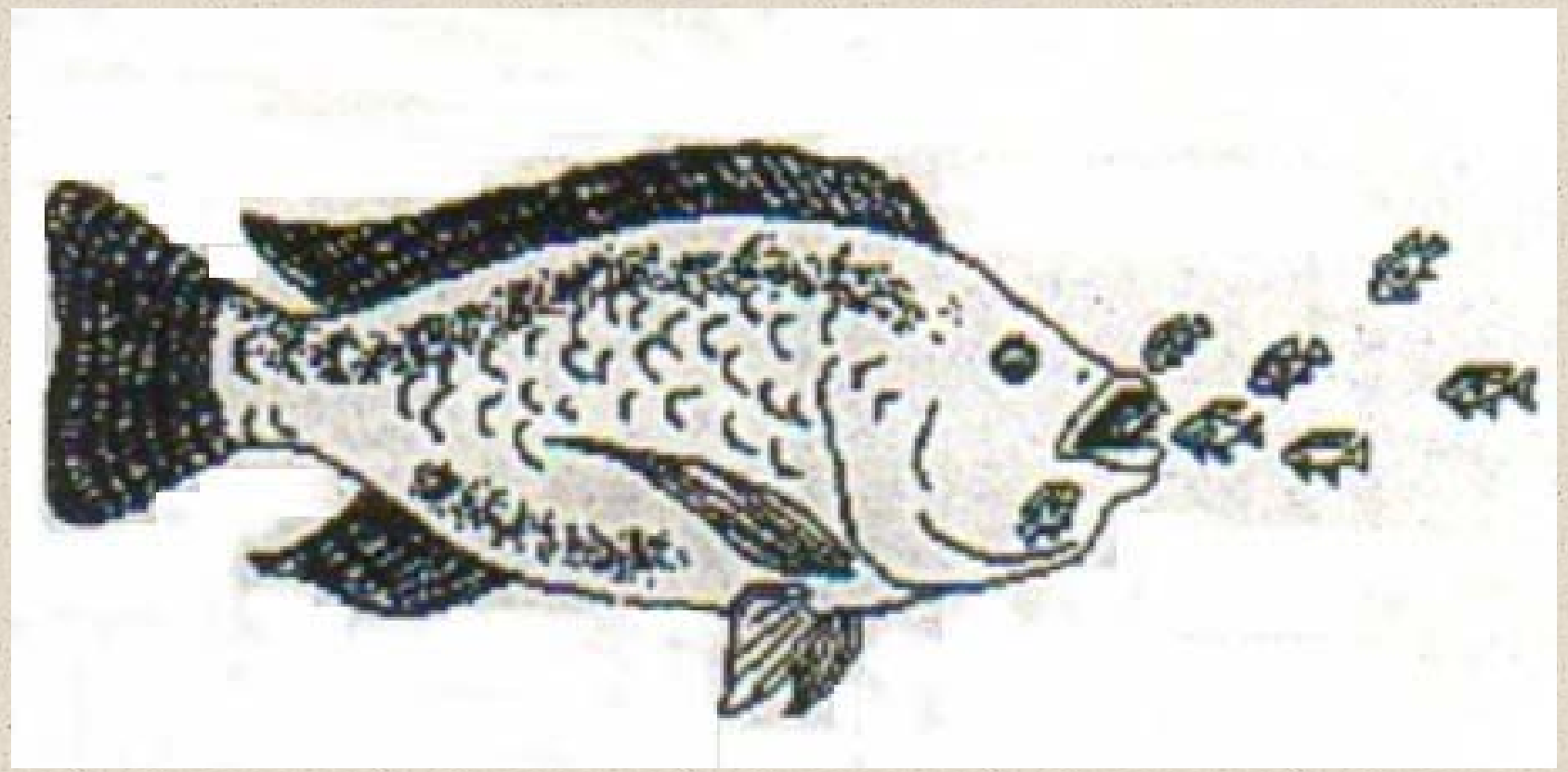
FACTORS INFLUENCING GROWTH AND DEVELOPMENT IN FISH

	Fertilization/ Formation Stage	Hatching/ Nursery Stage	Grow-out Stage
Genetics	➢ Color ➢ Physical configuration ➢ Growth potential ➢ Sex ➢ Environmental tolerance		
Environment	➢ Health conditions of the mother ➢ Quality of the eggs ➢ Incubation (mechanical injury) ➢ Water quality	➢ Food quality ➢ Food quantity ➢ **Timing of first feeding** ➢ Stunting ➢ Water quality	➢ Food quality ➢ Food quantity ➢ Water quality ➢ Sex ➢ Sexual interaction ➢ Social interaction ➢ Stocking density ➢ Fish health condition



BASIS OF THE STUDY

- In environment where there are lots of opportunistic predators and danger can be everywhere, the mother would sometimes extend the period of care therefore delaying the release of her broods to safeguard them from being eaten.
- While this instinct may be effective in ensuring the survival of fry, it can also result in the delay of exogenous feeding or inability of the fry to feed efficiently.

PREVIOUS WORK

Rana (1990) observed that a delay in feeding of fry in both *O. niloticus* and *O mossambicus* of 6-18 days post-hatching decreased their condition factor (weight-to-length relationship).

OBJECTIVE OF THE STUDY

This study was conducted to investigate the effect of delayed stocking and provision of exogenous food during first feeding stage on growth and survival from fry up to adult stage.

METHODOLOGY

❖Phase 1

Focused on the determination of the effect of delayed stocking and feeding on the early stage growth and survival of fry during nursery in 1m^2 hapa

❖Phase 2

Focused on the effect stocking and feeding on the late growth and survival in cages (2 x 2 x 1 m B-net cage) and earthen pond (approx. 200 m^2)

Phase 1:

Treatment	Time of stocking and feeding	
1	Immediately after yolk absorption	(200 fry)
2	Two days after yolk absorption	(200 fry)
3	Four days after yolk absorption	(200 fry)
4	Six days after yolk absorption	(200 fry)
5	Eight days after yolk absorption	(200 fry)

Phase 2:

Treatment	Cage (15 - 2 x 2 x 1 m) (Separate rearing – 3 reps)	Pond (1 - 200 m^2) (Communal rearing)
1	20 fish/m^2 (80/cage)	4.5 fish/m^2 (180)
2	20 fish/m^2 (80/cage)	4.5 fish/m^2 (180)
3	20 fish/m^2 (80/cage)	4.5 fish/m^2 (180)
4	20 fish/m^2 (80/cage)	4.5 fish/m^2 (180)
5	20 fish/m^2 (80/cage)	4.5 fish/m^2 (180)

RESULTS OF THE STUDY

Table 1: Growth parameters of fry before stocking and feeding and after 43 days nursery in fine mesh 1m^3 cages.

Growth parameters (Mean± SD)	**Treatment (8 replicates)**				
	1	**2**	**3**	**4**	**5**
Initial length (mm)	6.29±0.46b	6.91±0.20a	7.14±0.23a	7.11±0.33a	7.16±0.28a
Initial weight (mg)	10.11±0.69a	10.13±0.93a	9.95±0.82a	8.38±1.39b	8.91±1.15b
Final weight (g)	2.10±0.23a	2.03±0.42a	1.74±0.40a	1.84±0.55a	2.02±0.96a
Survival (%)	99.61±0.77a	98.87±2.31a	98.43±2.77a	98.99±0.95a	99.74±0.69a

Means within a row with the same letter script are not significantly different at 5% probability

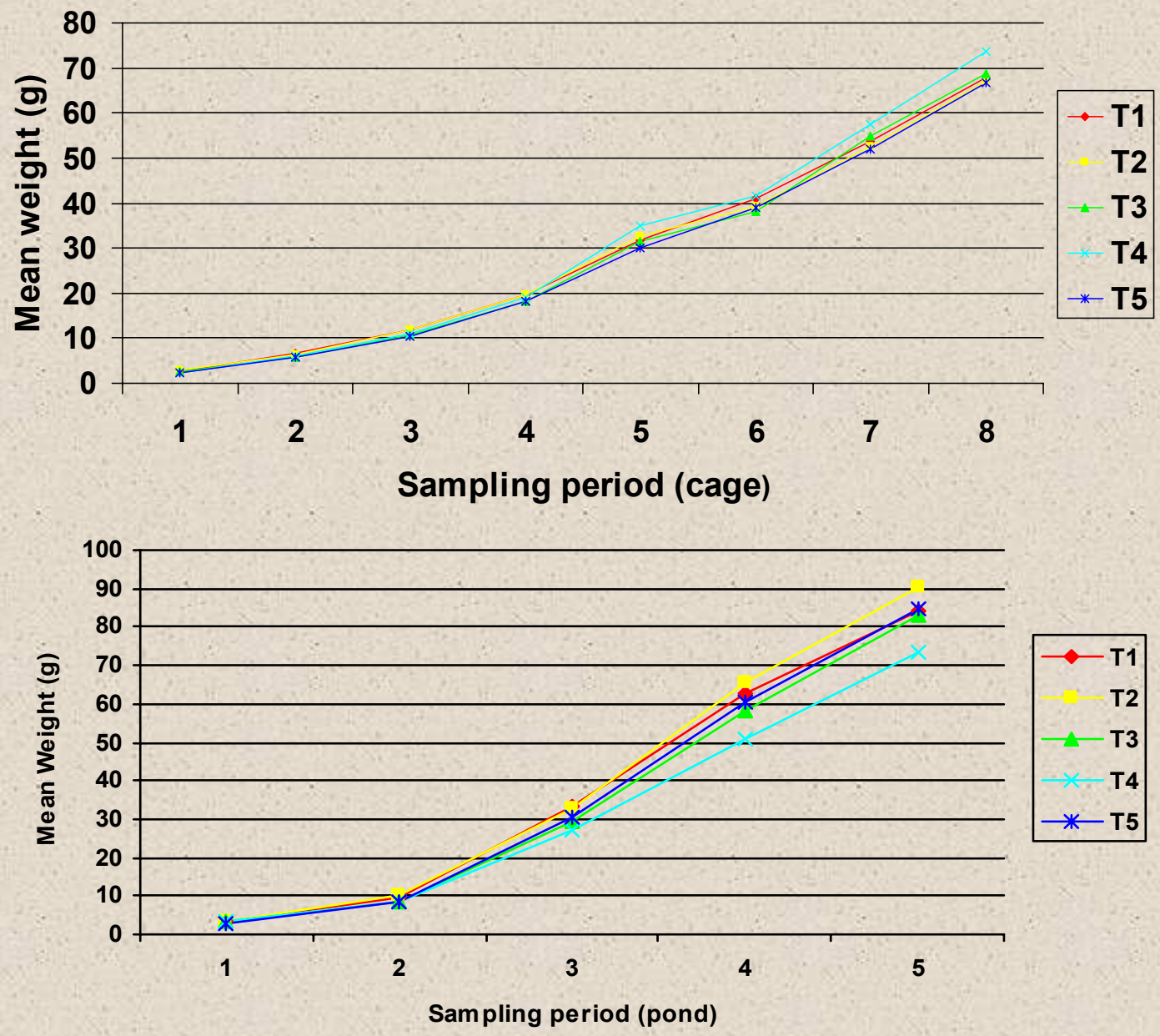


Figure 1. Mean weight of Nile tilapia in cage and pond at different sampling periods

Table 2: Growth parameters during grow out in cages and earthen pond

Culture environment	Growth parameters (Mean±SD)	Treatment 1	2	3	4	5
Cage in Pond (Separate rearing in 2 x 2 m net cages installed in approximately 200 m^2 earthen pond with 3 replicates)	Initial length (cm)	4.18±0.03a	4.10±0.15a	3.96±0.04a	3.94±0.11a	3.93±0.17a
	Initial weight (g)	2.71±0.04a	2.89±0.24a	2.46±0.16a	2.33±0.28a	2.41± 043a
	Final length (g)	12.04±0.34a	12.02±0.45a	12.03±0.41a	12.06±1.14a	11.70±0.3)a
	Final weight (g)	67.93±5.76a	67.03±2.89a	68.88± 5.94a	73.52±20.63a	66.67± 4.80a
	Survival (%)	79.58±29.96a	97.08±2.60a	77.92±36.08a	73.33±41.88a	92.92± 6.29a
	Dressed out weight (%)	78.45± 1.07a	79.55±1.16a	80.41±1.35a	78.99±2.22a	77.91±0.72a
	Fillet weight (%)	31.91±2.67a	31.66±2.14a	33.16±1.04a	32.45±2.52a	31.35±1.09a
Earthen pond (Communal rearing in one approximately 200 m2 earthen pond)	Initial length (cm)	4.51±0.30a (100)	4.56±0.38a (100)	4.40±0.31b (100)	4.26±0.31c (100)	4.36±0.36b (100)
	Initial weight (g)	3.41±0.59b (100)	3.43±0.86b (100)	3.64±0.70a (100)	3.18±0.64c (100)	3.10±0.61c (100)
	Final gain length (g)	8.46±0.86a (143)	8.54±1.01a (143)	8.55±0.98a (141)	8.07±1.10b (154)	8.67±1.00a (137)
	Final gain weight (g)	84.01±17.33b (143)	90.49±19.55a (143)	83.31±18.51b (141)	73.38±19.12c (154)	84.80±18.04b (137)
	Survival (%)	79.44	79.44	78.33	85.56	76.11

Means within a row with the same letter script are not significantly different at 5% probability

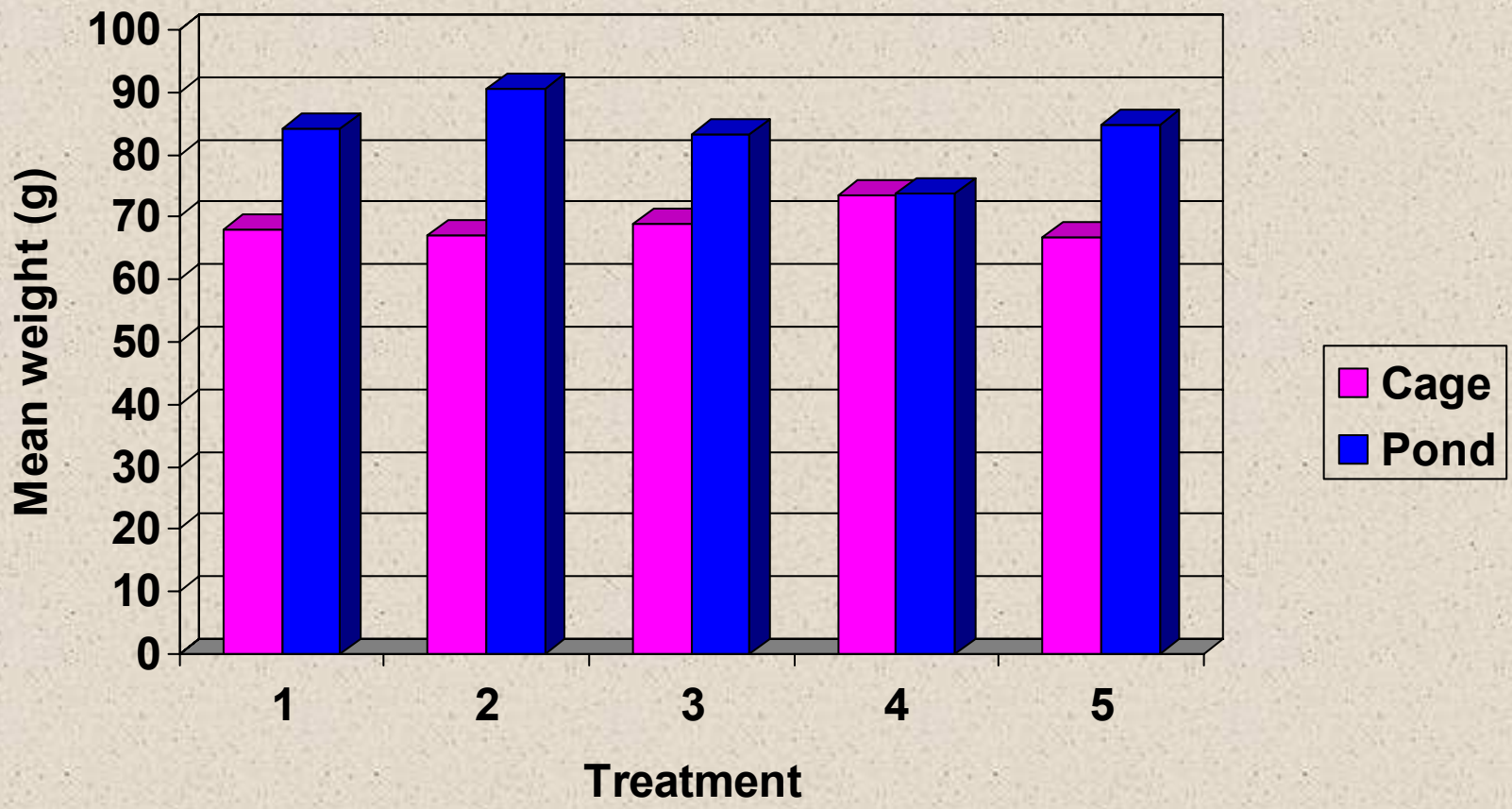
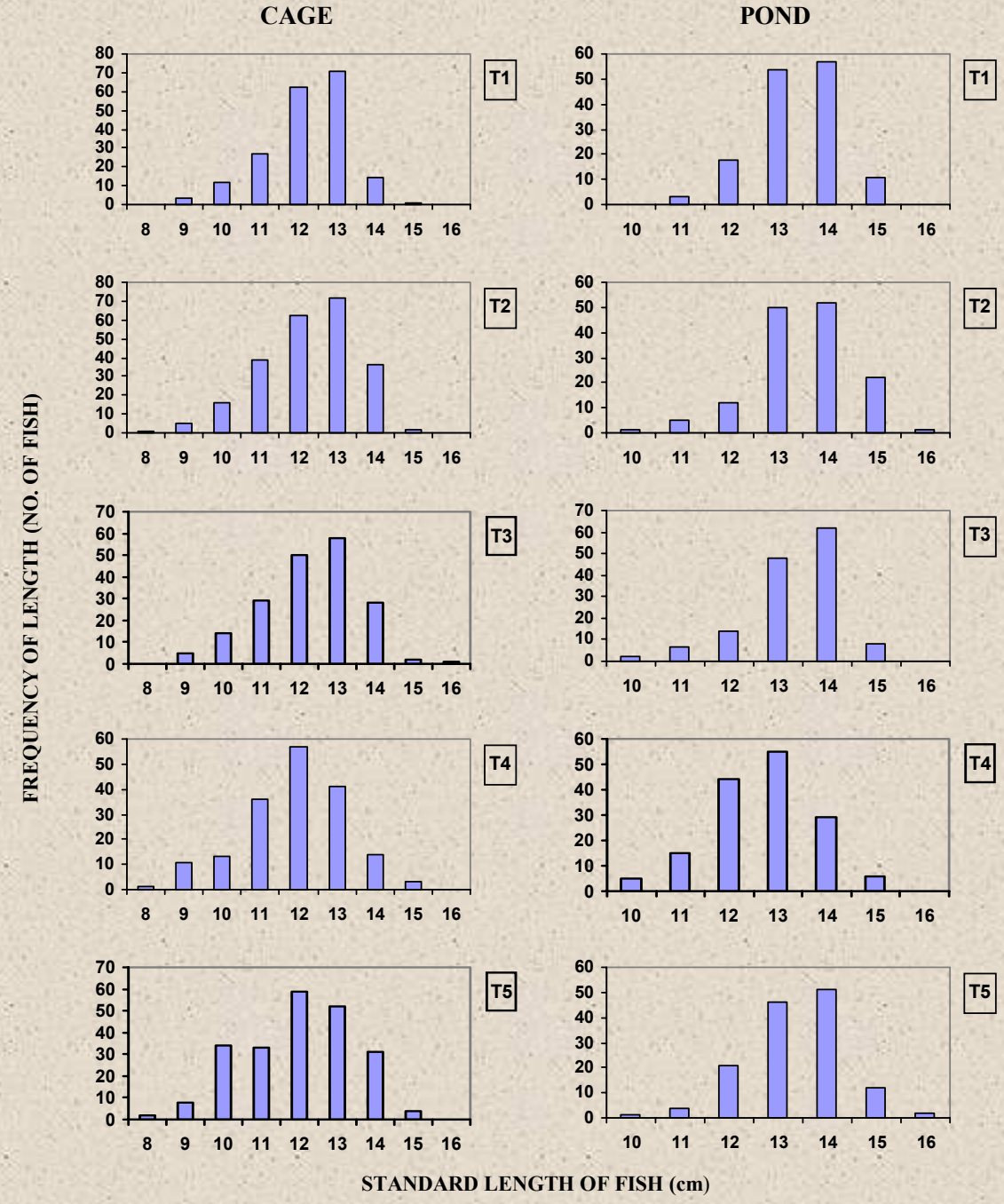


Figure 2. Final mean weight of the five treatments in cage and pond.



Figures 3. Length frequency distribution of all the fish in cage and in pond

FINDINGS OF THE STUDY

- The result of the study indicated that the delaying in stocking and provision of initial exogenous food could affect weight during period of starvation.
- When the starved fry were stocked in cages installed in pond rich with natural food and provided their initial exogenous food the lost weight during starvation were readily compensated and able to catch up with those non-starved fry.

IMPLICATION OF THE RESULTS

- In tilapia where the mother may deliberately delay the release of its brood during times of danger, the delay in feeding is a common phenomenon.
- The ability of the fry to readily compensate for the lost weight without any harmful effect could have been part of their evolutionary development leading to mouth brooding.

Thank you very much!