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"Fish and Shrimp as Resources for Livelihood Development of Coastal Fishing Communities in Egypt: DNA Barcoding Application in Fisheries Management, Marine Biodiversity Assessment, Management and Conservation"
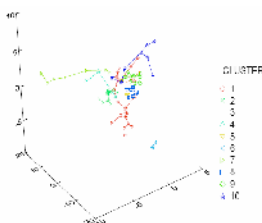
RESULTS

## Discussion

DNA marker-based pedigrees

It is technically possible to simultaneously select for growth and disease resistance in two environments (SPF and SPR) simultaneously.
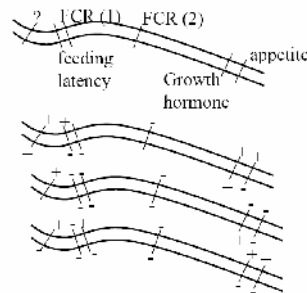

Weight distributions
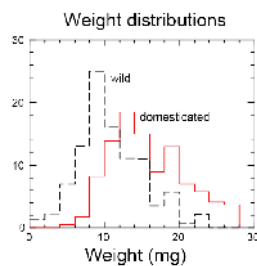
Costs and pay-offs

type	start	gain		cost	
on farm genetics	1 yr	5%	10%	10	100 k$
centralized breeding facility (selection)	3 yr	5% – 10%		0.5 – 2 m$	
marker assisted selection	5+ yr	3% – 10%		0.1 – 2m$	
transgenics	1 – 10+ yr	200 – 400%		0.1 – 2m$	

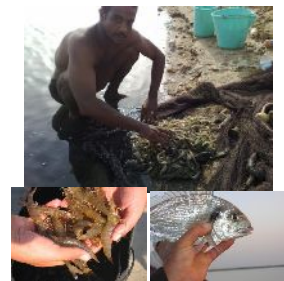Technology cost-price squeeze

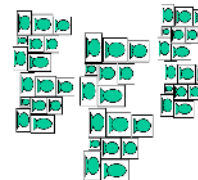Survival curves
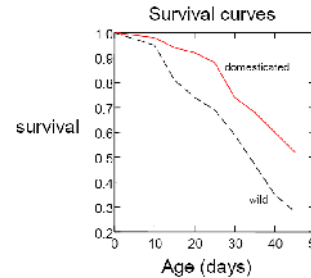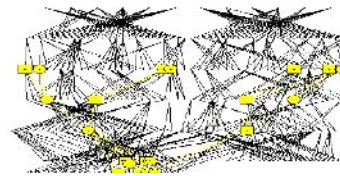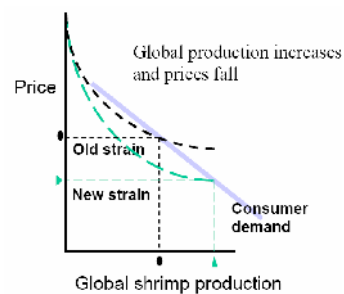
What aquaculture geneticists do

Genetics options for growers
1. Join a big genetics program where many farmers share the benefits.
2. Professional on-farm private genetics.
3. Do-it-yourself (sophisticated amateur).
4. Buy the best commercial seed every year.
5. Common sense: breed the best animals.
6. Do nothing about genetics.

MATERIALS & METHODS

What the geneticist sees

$$\blacktriangleright_{ijk} = \mu \mid M_i \mid F_{ij} \mid \varepsilon_{ijk}$$

Families identified by markers

Strategies for genetic improvement
1. Insert additional plus genes (transgenics).
2. Hybridize, hoping that the offspring will exceed both parents.
3. Identify a plus allele and select individuals which are carrying it (QTL selection).
4. Select a gene which is close to the plus gene (marker assisted selection).
5. Select individuals based on their performance and/or performance of relatives.

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