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Organic Tilapia Culture in Israel

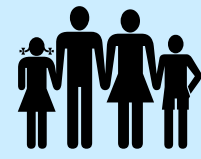
Ana Milstein¹ and Omri Lev²

¹ Fish & Aquaculture Research Station, Dor.

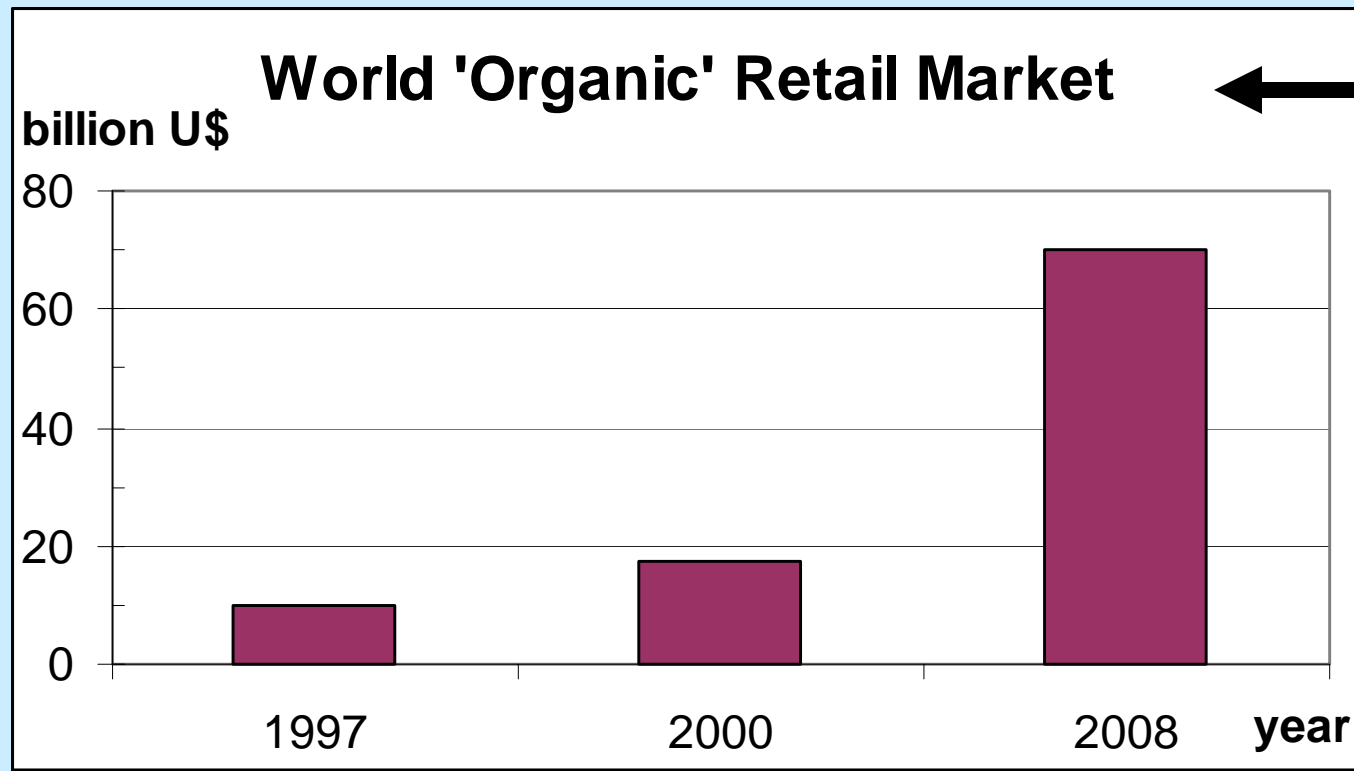
² Kibbutz Geva Fish Farm.

demand of 'healthy' foods

environmental concern

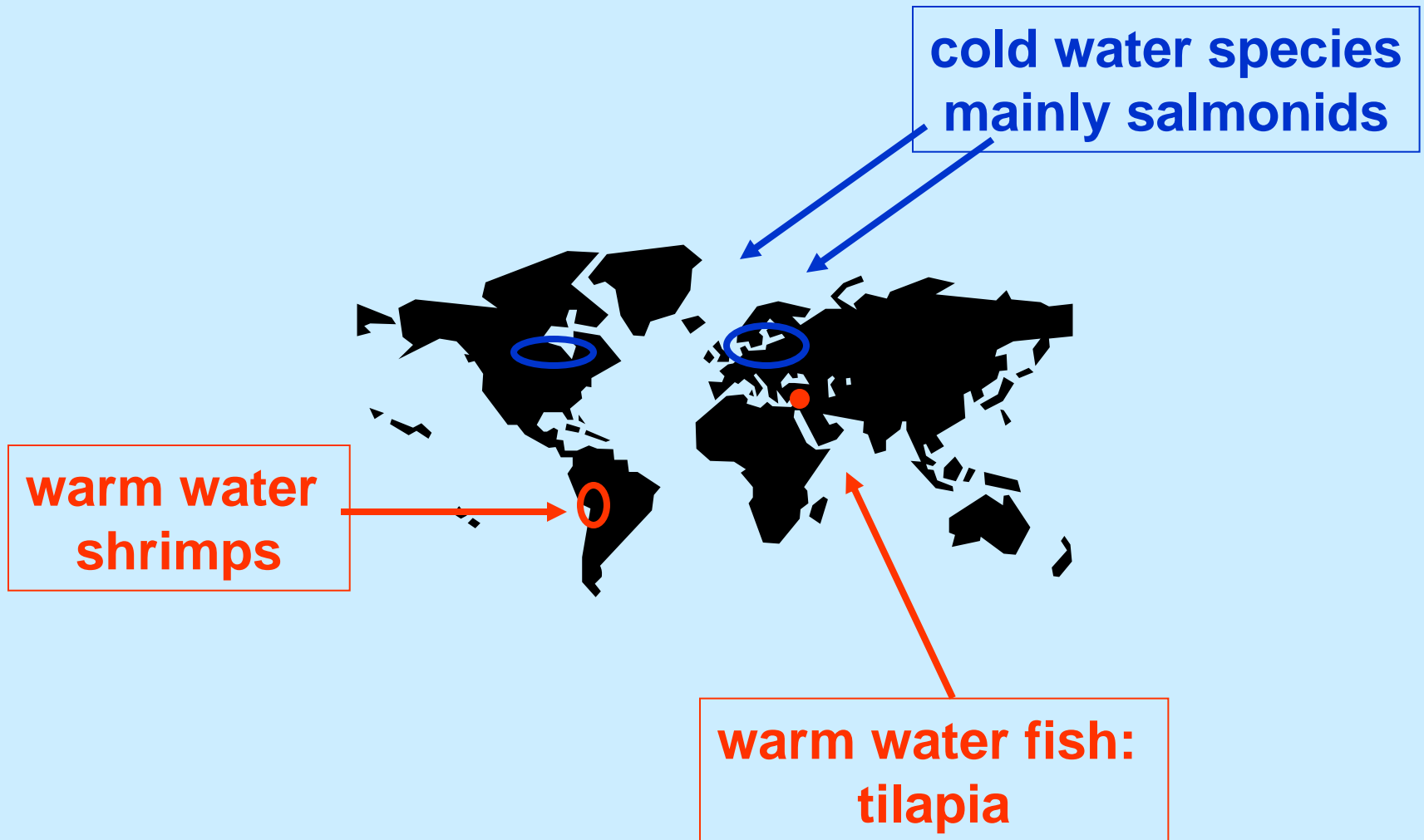


public pressure



(Estimated growth rate: about 18 % per year (world average))

Organic aquaculture



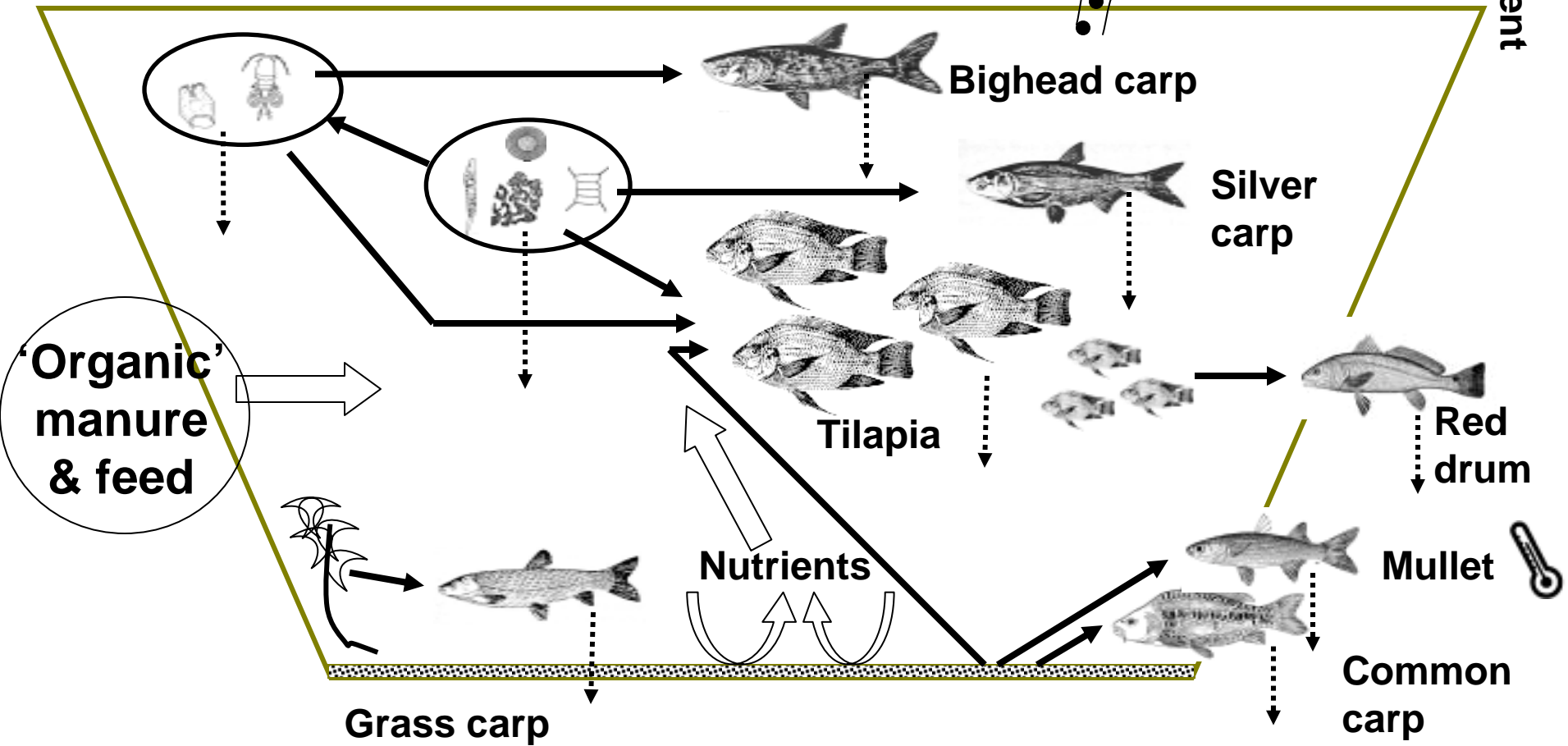
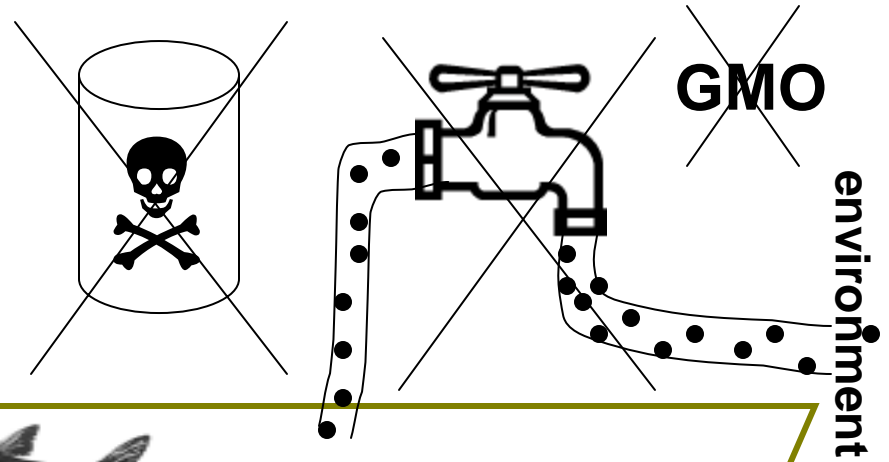
Basis of 'organic' aquaculture production

- maintenance of the aquatic environment and surrounding ecosystems
- reduce environmental impact of effluents and wastes
- encouraged use of by-products and waste materials as feed source
- enhancement of biological cycles in production units

Basis of 'organic' aquaculture production

- reduced stocking density
- prohibition of genetically modified organisms (GMO)
- prohibition of synthetic fertilizers
- prohibition of hormones
- avoidance of chemotherapeutic agents
- promotion of polyculture when applicable

'Organic' fishpond at Geva fish farm (3.5 ha)

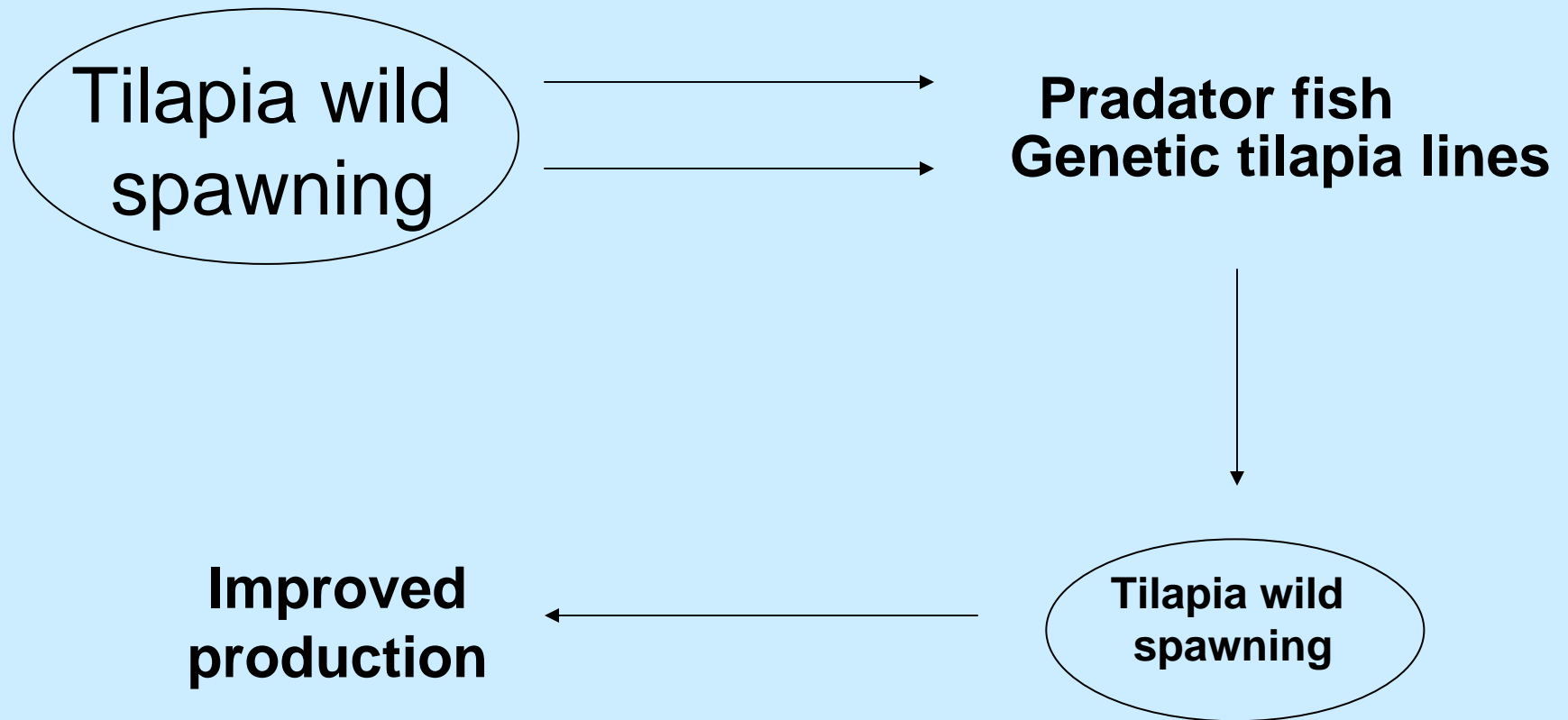


Commercial organic tilapia production in Israel

Geva fish-farm, 1 pond of 3.5 ha, years 2000-2003

Fish	Stocking (number/ha)	Observations	Harvesting (ton)
tilapia	8,000-12,000	80-90% of fish	5-13
mullet	1,500 in 2000-2001	temp>30°C surv 50%	2-3
common carp	☑		☑
black carp	☑	restocked each year	☑
grass carp	☑	restocked each year	☑
silver carp	☑	restocked each year	☑
red-drum	500	5% of fish, 6g at st.	0.3
TOTAL	11,000-14,000		9-20
wild tilapia spawning		reduced since 2001: cross of genetic lines that give less females	3 → 1

'Organic' tilapia production problem: wild spawning



'Organic' tilapia production problem: feed must also be 'organic'

Conventional feeds

'Organic' feeds

Protein sources:

-- soja.....mostly ~~GMO~~

-- fishmeal.....fisheries are
not 'organic'

Prohibited

Allowed only
up to 5%

14% protein
'organic'
feed pellets

'Organic' tilapia production problem: feed must also be 'organic'

'Organic' feeds

Protein sources:

-- 'organic' soja

-- fishmeal up to 5%

**30% protein
'organic'
feed pellets**

**\$
Feed price
doubles**

**May compromise
profitability**

Periphyton based 'organic' tilapia production trial









Tilapia *Oreochromis aureus* **stocking:**

3-Jul-2003

each half pond = 250 m²

	number	biomass (kg)	mean weight (g)
periphyton side	258	64.660	250
feed side	258	65.100	252

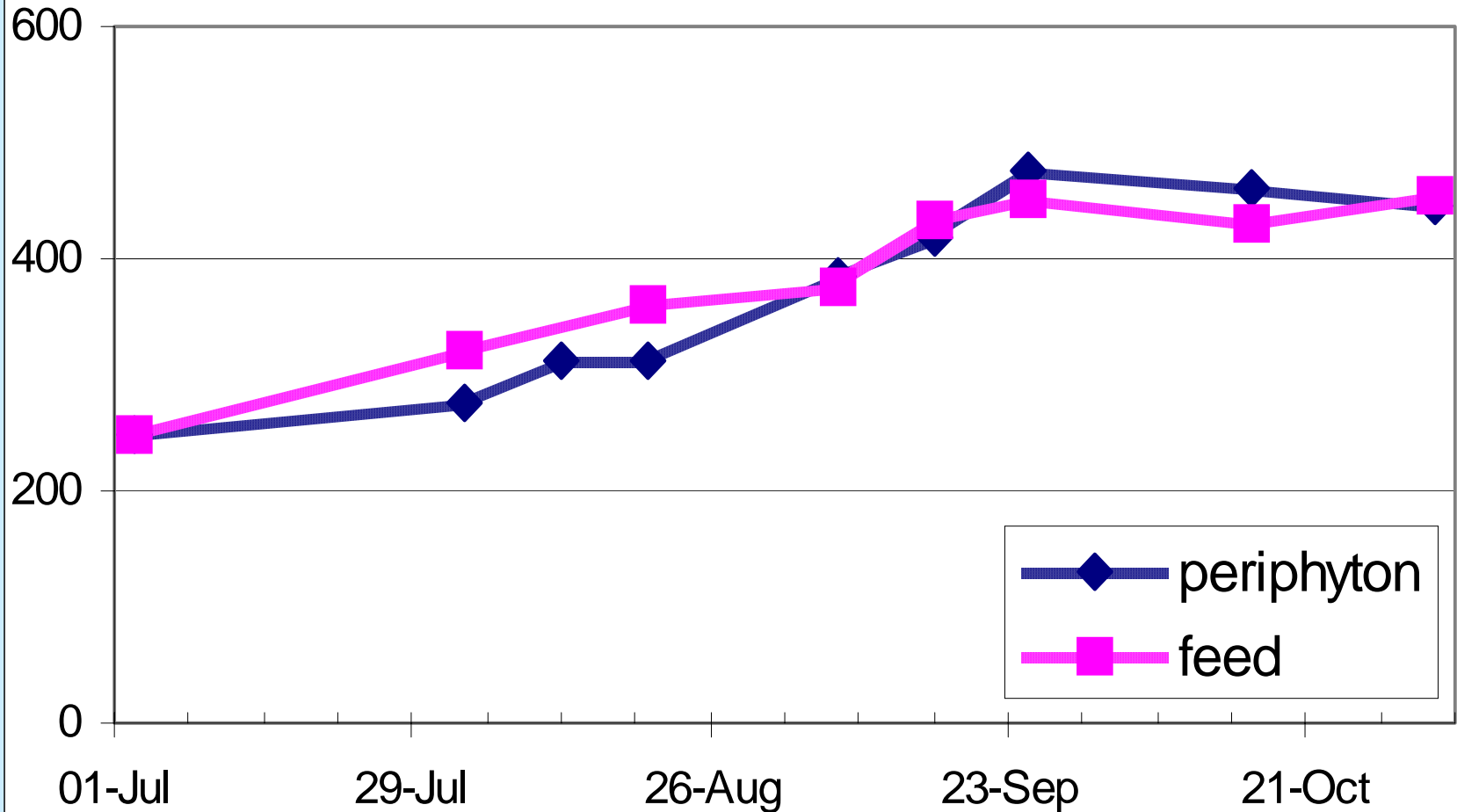






gram

Tilapia weight, Geva 2003



Tilapia harvesting:

2-Nov-2003, 122 culture days, each half pond = 250 m²

	periphyton side	feed side
fish number	248	236
biomass (kg)	111	107
mean weight (g)	446	455
survival (%)	96	91
growth (g/day)	1.61	1.68
yield (kg)	48.6	48.4
wild spawn. (kg)	13	10
feed (kg)		800
manure (kg)	90	

Conclusions:

- tilapia actively feeds on periphyton
- periphyton-based aquaculture is appropriate to reduce costs and allow an economically viable organic tilapia production



Thanks