

# Tilapia Production



C. Greg Lutz, PhD

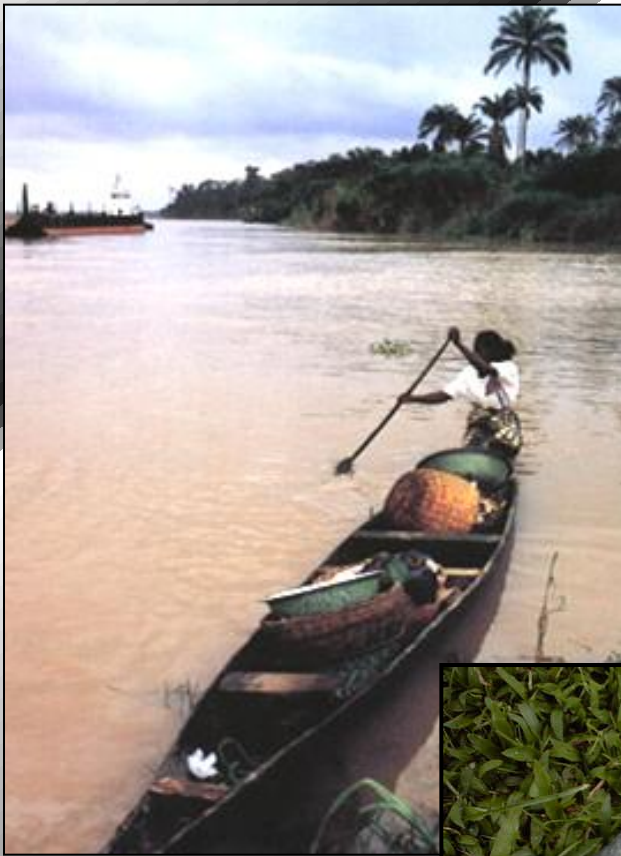
## Domestic Tilapia Consumption – USA

2009

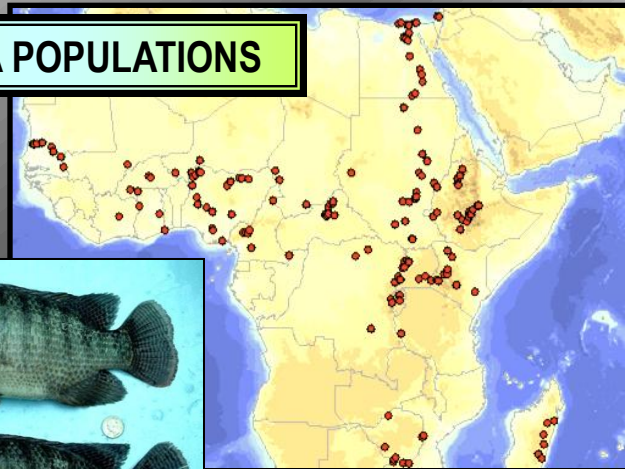
2010

Shrimp	4.1	Shrimp	4.0
Canned Tuna	2.5	Canned Tuna	2.7
Salmon	2.04	Salmon	1.999
Alaska Pollock	1.454	Tilapia	1.450
Tilapia	1.208	Alaska Pollock	1.192
Catfish	0.849	Catfish	0.800
Crab	0.594	Crab	0.573
Cod	0.419	Cod	0.463
Clams	0.375	Pangasius	0.405
Pangasius	0.356	Clams	0.341

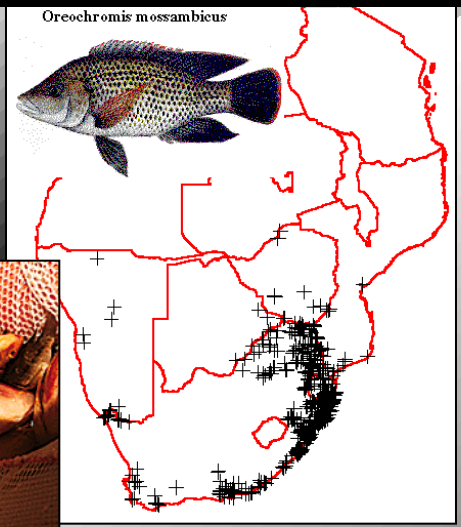
\*Data in pounds per capita.



## NILE TILAPIA POPULATIONS

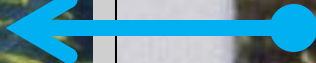


## MOZAMBIQUE TILAPIA POPULATIONS



# Breed Formation: Synthetic Lines





# Global Production





**Comparison of raw material fillet costs - 5 tilapia production system models.**

<b>System</b>	<b>Production Cost*/kg</b>	<b>Raw Material Cost/kg Fillet</b>
<b>Tropical Ponds</b>	<b>\$1.633</b>	<b>\$4.80</b>
<b>Tropical Raceways</b>	<b>\$1.637</b>	<b>\$4.81</b>
<b>Sub-Tropical Greenhouse Ponds:</b>		
<b>Southern U.S.</b>	<b>\$2.274</b>	<b>\$6.69</b>
<b>Temperate Indoor Tanks</b>	<b>\$3.570</b>	<b>\$10.50</b>

**\*Direct Costs and Depreciation**

Lutz, C.G. 2000. Production economics and potential competitive dynamics of commercial tilapia culture in the Americas. Pages 119–132 in B.A. Costa-Pierce and J.E. Rekoey, eds. Tilapia Aquaculture in the Americas, Vol. 2. The World Aquaculture Society, Baton Rouge, Louisiana, United States.

**200000 lb per year  
tropical raceway  
facility**

**Table 2. Costs: 200,000 lb-per-year raceway facility in Central America or Carribean basin**

Item, Unit	No. of Units	Cost/Unit	Total
<b>Facility &amp; Equipment</b>			
Land, Acre	4	\$100	\$400
Permits			\$5,000
Raceway Pairs	4	\$18,200.00	\$72,800
Water Supply & Distr.	1		\$3,400
Service Building	1		\$3,000
Feed Storage	1		\$3,000
Truck, 3/4 ton 4x4	1		\$25,000
ATV, 4-wheel	1		\$6,000
PTO low lift pump	1		\$2,400
Shop Equipment	1		\$3,500
D.O. Meter	2	\$850	\$1,700
Aerators (fixed)	2	\$900	\$1,800
Miscellaneous			\$1,400
Live haul tank/trailer	1		\$1,600
<b>TOTAL</b>			<b>\$131,000</b>
			<b>\$0.655 per lb. per year</b>
<b>Operations</b>			
Fingerlings, 50g	128000	\$0.30	\$38,400
Feed, lb	332860	\$0.15	\$49,929
Electricity, kwhr	22616	\$0.13	\$2,940
Fuel	1840	1.95	\$3,588
Hired Labor	3	\$4,500	\$13,500
Management	1		\$18,000
Miscellaneous			\$3,300
Repairs/Maint.			\$6,280
<b>TOTAL</b>			<b>\$135,937</b>
			<b>\$0.680 per lb.</b>
Estimated Depreciation		\$12,560	
		<b>0.0628 per lb.</b>	
<b>Direct Expenses and Depreciation:</b>		<b>\$0.74 per lb.</b>	

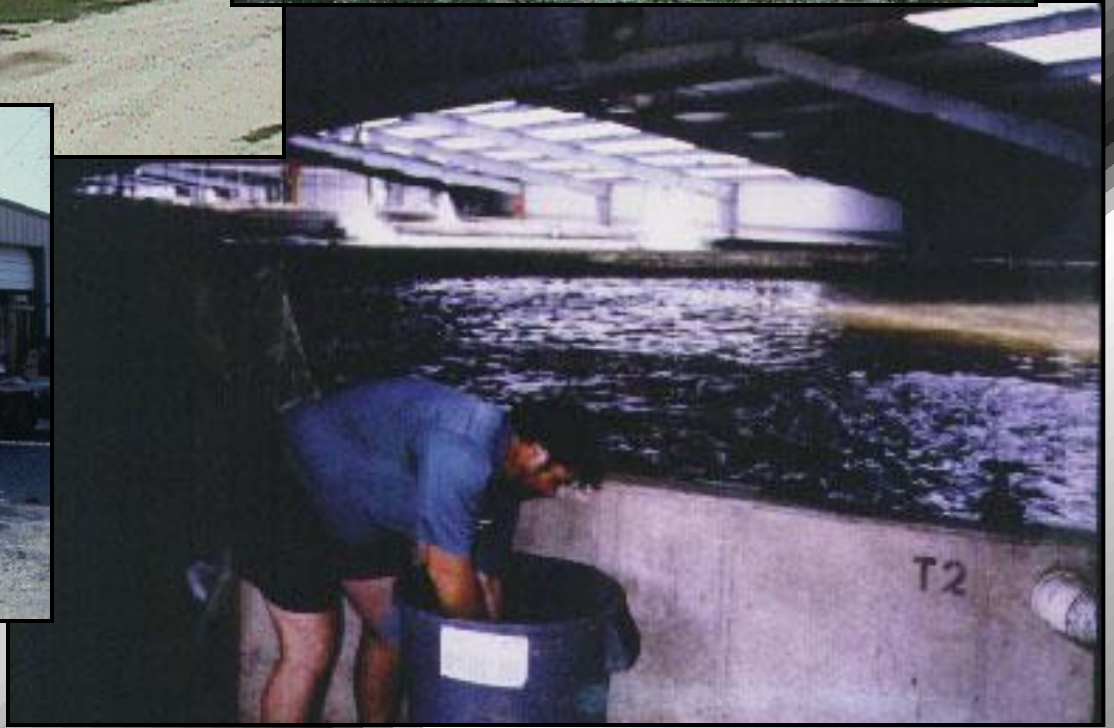
**200000 lb per year  
temperate indoor  
facility: After  
O'Rourke 1996**

**Table 5. Costs: 200,000 lb-per-year indoor facility in northern United States or Canada**

Item, Unit	No. of Units	Cost/Unit	Total
<b>Facility &amp; Equipment</b>			
Land, Acre	2.0	\$2,500	\$5,000
Permits		\$450	\$450
Building, Slab, Drains, Plumb., Elec.	12800	\$21.34	\$273,152
Heating/Ventilation, sqft	12800	\$0.81	\$10,368
Tanks (Growout, reserv., purge)	lot		\$93,928.00
Walkways	4	\$700	\$2,800
Filters/pumps	lot		\$91,000.00
Blowers	4	\$1,042	\$4,168
Oxygen System: Piping, Cones	4	\$3,000	\$12,000
Generator	1		\$8,000
Emergency Oxygen Systems	4	\$500	\$2,000
Equipment/Tools	2	\$2,298	\$4,596
Water Testing Equipment	lot		\$5,200
Feed Storage/Feeding System	4	\$7,200	\$28,800
Settling Ponds	4	\$3,000	\$12,000
Alarm System	1	\$8,000	\$8,000
Truck and Trailer*	1	\$26,000	\$26,000
<b>TOTAL</b>			<b>\$587,462</b>
			<b>\$2.937 per lb. per year</b>
<b>Operations</b>			
Labor (Wages + Finge), hr.	4732	\$9.60	\$45,428
Fingerlings, 20 g	lot		\$24,960
Feed, lb	lot		\$80,092
Water	lot		\$15,852
Oxygen	lot		\$38,264
Electricity	lot		\$41,292
Repairs/Maintenance	lot		\$25,320
Insurance	lot		\$4,000
Other (fees, licenses, misc.)	lot		\$4,054
Marketing*			\$1,500
<b>TOTAL</b>			<b>\$280,762</b>
			<b>\$1.404 per lb.</b>
Straightline Depreciation		\$43,032	
		<b>\$0.215 per lb.</b>	
<b>Direct Expenses and Depreciation:</b>		<b>\$1.62 per lb.</b>	

\*Added for this comparison

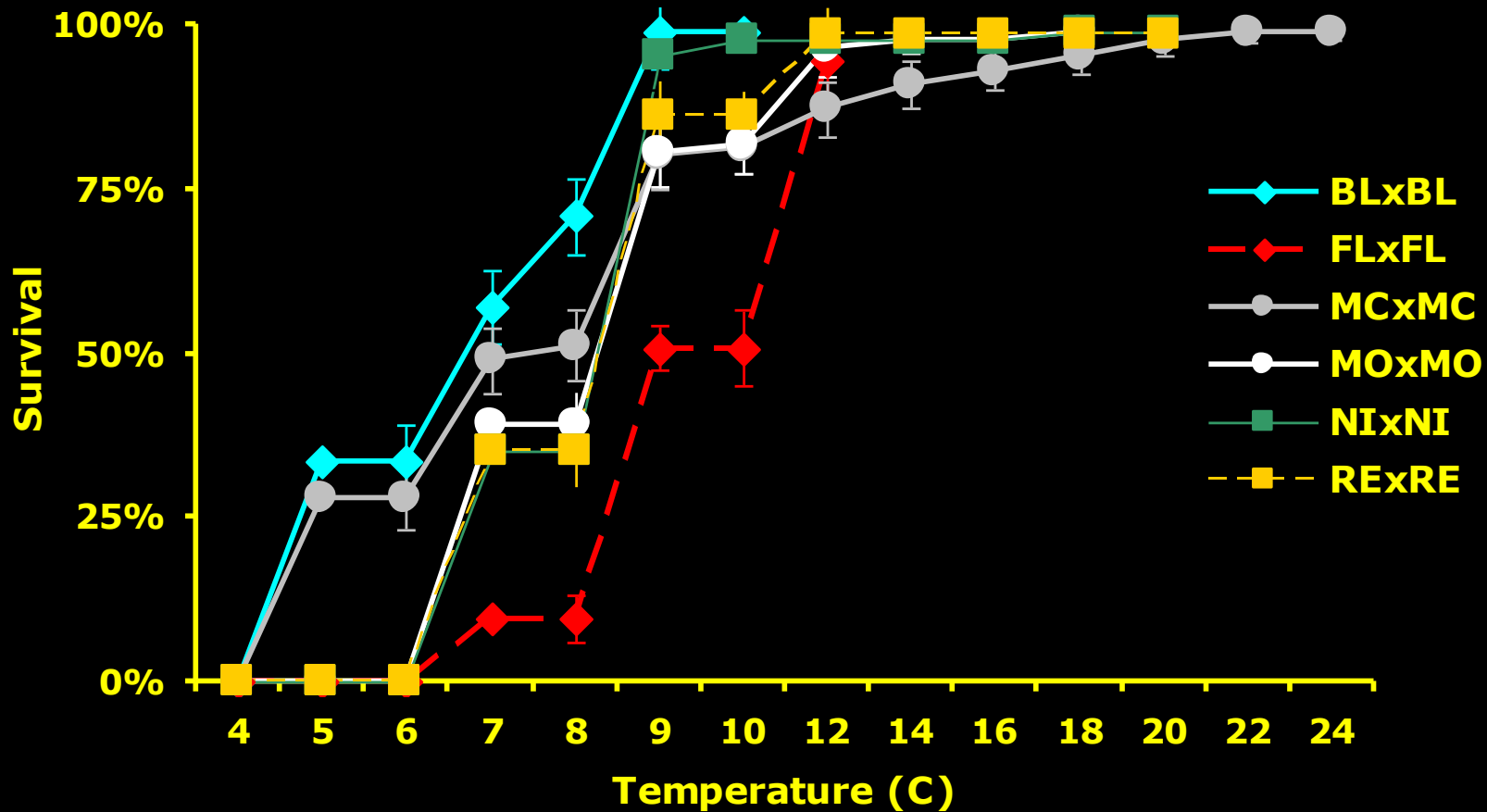
# Domestic Production – North America



# LIVE MARKET – No competition from Imports



# Cumulative survival of purebred tilapia varieties exposed to decreasing temperature of -2C / day (Mean $\pm$ S.E)



# Determination, Manipulation and Control of Sex

## Genetic Systems vs. Environmental Influences



<u>Determination</u>	♀♀	♂♂	<u>Modifier</u>	<u>Tilapia Species</u>
I	XX	XY	AA	<i>O. niloticus, O. mossambicus</i>
II	WZ	ZZ	aa	<i>O. aureus, O. hornorum</i>
<u>Genotypes</u>	♀♀	♂♂		<u>Tilapia Species</u>
I	AAXX	AAXY		<i>O. niloticus, O. mossambicus</i>
II	aaWY	aaYY		<i>O. aureus, O. hornorum</i>

## Commodity Markets – Belong to Imported Product



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Questions?

