

Utilization of the Tilapia Invasive
Species as a Low-Cost Protein Feed
to Improve Egg Production

WSARE Project # FWO9-312

\$29,892.00

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Introduction

- Little improvement in egg production over the last 20 years
- Wide range of issues but most prominent and consistent is feeding
- Imported Chicken Feed is very expensive (\$33-\$44 per 50 lb bag)
- Limited number of small farmers
- Need to develop a local feed that is cost-effective
- Tilapia (*Oreochromis mossambicus*) is an invasive species-established in mangrove areas and freshwater holes and taro patches
- Land crabs (Family Gecarcinidae) are also abundant. Often considered a pest since they consume plant materials causing extensive damages to field crops

Introduction

- Feed mixture: tilapia, land crabs, and copra supplemented with green grass clippings
- Target: family farms- less than 100 layers
- Simple low-cost portable pens made from bamboo. Bedding materials – dry grass

Objectives/Targets

- 1. Conduct feeding trials on laying chickens by using a local feed mixture consisting of tilapia, land crab and copra. This is a comparative study of the local feed mixture against commercial layer feed, and a combination of both commercial feed and the local feed mixture.
- 2. Identify sources and fishing methods for capturing tilapia in mangroves
- 3. Develop educational materials and train farmers in simple feed production and processing using locally available materials.

Expected Outcomes

- Adoption of new local feed for local egg production
- Adoption of egg production system using simple portable pens
- Improve egg production in Yap
- Improve competition with imported eggs
- Improve family/small farm resources
- Help reduce tilapia invasion in the mangrove areas
- Increase sustainable usage of land crabs and help maintain their population

Method

- Three farmers to try out the new feed and compare against commercial feed
- Raise chicks to 4.5 -5 months or start laying with chick starter/grower feed
- Distribute to farmers
- Three farmers to conduct the trials
- Three farmers provide coconuts and catch tilapia and land crabs
- Coconut grater

Method cont'd

- Coconut milkd extractor – oil for local market
- Meat grinder – tilapia and land crabs
- Cook tilapia and land crabs and mix with grated coconut
- Protein – two part tilapia & one part land crab
- Outreach plan: brochure, COM-FSM website

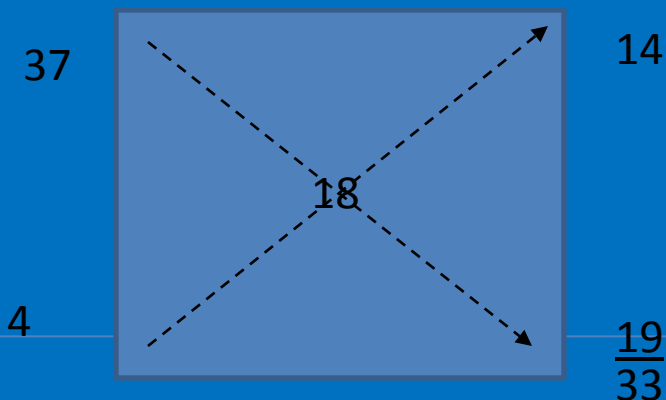
Trials

- Compare productivity of three different types of feed
 1. Commercial layer feed
 2. $\frac{1}{2}$ commercial layer feed X $\frac{1}{2}$ improved local feed
 3. Improved local feed – mixture of tilapia, land crabs, and copra supplemented with grass cuttings

Ration Formulation

Improved local feed:

- 55% part tilapia X 40% crude protein =22
 - 45% part land crab X 35% crude protein =15
 - Mature coconut flesh, fresh 4% CP
- 37% CP



Nutrient composition of coconut products

THE PACIFIC ISLANDS FOOD COMPOSITION TABLES

Key	Food name	Measure	Water	Energy	Energy	Protein	Total fat	CHO available	TDF	Na	Mg	K	Ca	Fe	
		g	g	kcal	kJ	g	g	g	g	mg	mg	mg	mg	mg	
X	COCONUT PRODUCTS														
X010	Coconut, desiccated	100	2	656	2 744	6.3	65.1	6.7	14.7	18	95	650	12	2.6	
		1 tablespoon	6	T	39	165	0.4	3.9	0.4	0.9	1	6	39	1	0.2
X011	Coconut, embryo germinating	100	84	74	310	1.3	3.6	8.5	1.8				19	0.7	
X013	Coconut, flesh, immature	100	86	81	338	1.8	5.9	3.8	3.2	33	30	377	2	1.3	
X019	Coconut, water only, immature	100	95	16	67	0.1	0.0	3.9	0.0	6	4	57	12	T	
X003	Coconut, flesh, mature	100	54	283	1 185	3.0	27.4	3.6	7.6	16	48	340	10	1.1	
		1 cup	94	51	266	1 114	2.8	25.8	3.4	7.1	15	45	320	9	1.0
		1 piece (5 x 5 x 1.3 cm)	45	24	127	533	1.4	12.3	1.6	3.4	7	22	153	5	0.5
X012	<u>Coconut, flesh, fresh, mature</u>	<u>100</u>	<u>45</u>	<u>398</u>	<u>1 664</u>	<u>4.0</u>	<u>40.0</u>	<u>3.5</u>	<u>7.3</u>	<u>17</u>	<u>57</u>	<u>370</u>	<u>14</u>	<u>2.2</u>	
X001	Coconut cream, canned/UHT	100	71	205	858	1.9	20.3	3.7	1.7	21	29	230	4	1.0	
		1 cup	155	110	318	1 330	2.9	31.5	5.7	2.6	33	45	357	6	1.6
X002	Coconut cream, fresh, no water	100	54	325	1 361	4.4	32.3	4.7	1.7	13	28	280	15	1.8	
X014	Coconut cream, water added	100	66	254	1 062	3.2	24.9	5.2	T	9	39	T	16	1.6	
X009	Coconut water, cavity fluid	100	92	22	93	0.3	0.2	4.9	0.0	110	9	310	29	0.1	
X018	Coconut oil	100	T	883	3 696	T	99.9	0.0	0.0	T	T	T	2	T	
X016	Coconut toddy, boiled	100	46	217	908	0.9	2.1	49.4	0.0	122	19	452	T	T	
X008	Coconut toddy, fresh	100	87	42	177	0.2	0.4	9.6	0.0	34	4	110	T	T	
X005	Coconut toddy, slightly fermented	100	89	27	114	0.2	0.3	6.0	0.0	43	4	137	T	T	

X WILD ANIMAL FOODS

Ration formulation cont'd

- $14/33 = 42\%$ 45% tilapia/land crab
- $19/33 = 58\%$ 55% coconut
- Feeding: For 100 lbs, 55 lbs coconut, 23 lbs tilapia & 22 lbs land crab
- Feeding: 3 lbs per 10 chickens per day
- Green grass clippings – free choice

Caring for growing chicks



Growing chicks



Simple portable chicken house



Catching tilapia



Tilapia in mangroves



Tilapia in mangroves



Fishing for tilapia



Tilapia Harvest



Local Feed Making

Tilapia



Ground tilapia-cooked



23%

Fresh Copra



Ground Copra



55%

Land Crabs



Ground land crabs-cooked



22%



Production system



Nesting Box



Electric Meat Grinder



Simple coconut extractor



Simple coconut extractor



Thank you!

