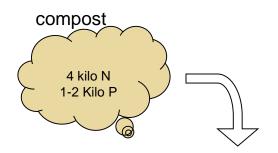
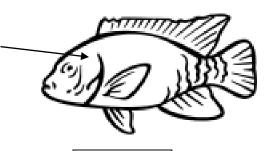


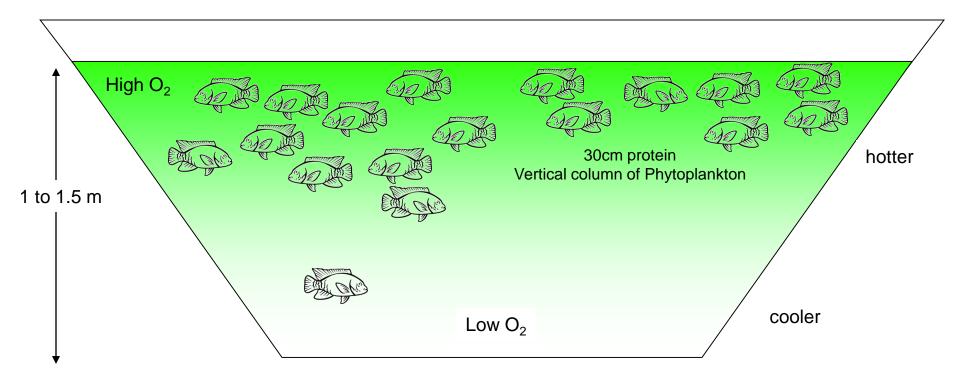
Green Water Culture



Gills covered With membrane To digest algae

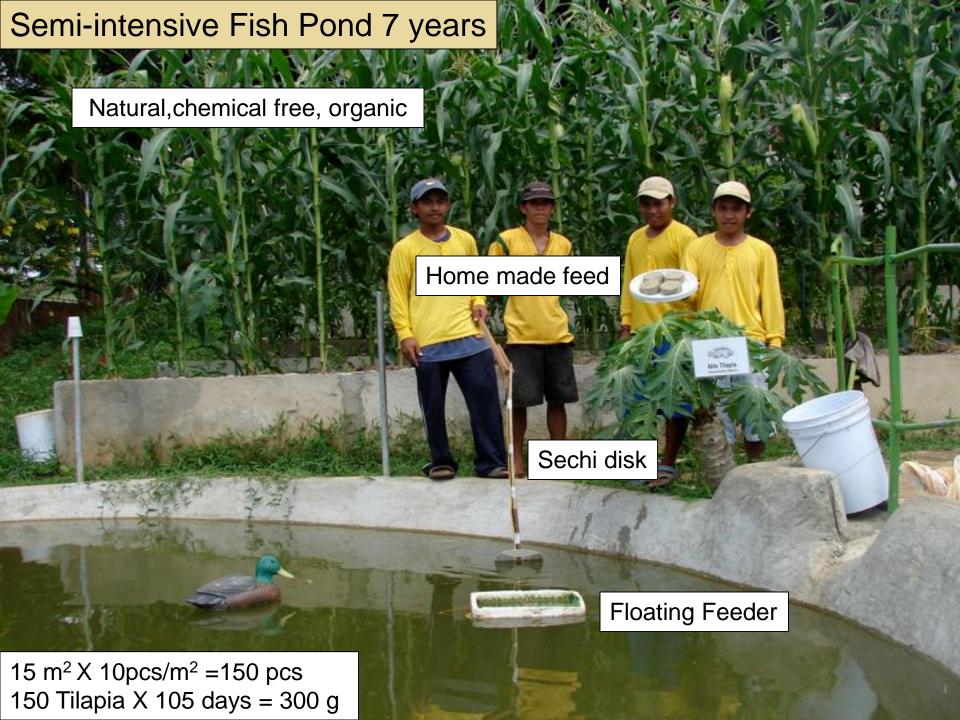


Tilapia

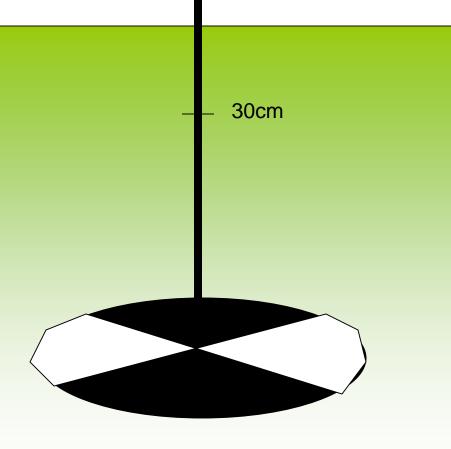








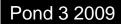
Sechi disk





1. Observe & interact

"Beauty is in the eye of the beholder"



April 7 55 cm April 14 54 cm April 21 48 cm April 28 33 cm



Observe & interact
 "Beauty is in the eye of the beholder"

Observe and interact - By taking time to engage with nature we can design solutions that suit our particular situation







March

Table 3. Basic Tilapia feed using on-farm inputs. Note, 1 USD = approximately 15 Pesos.

32.2%

8.00

8.00

14.00

9.2%

19.5%

3.4%

11.5%

23.0%

0.3%

0.1%

0.3%

0.3%

0.1%

0.1%

100.0%

512.34

28.00

8.00

17.00

3.00

10.00

20.00

0.30

0.10

0.26

0.26

0.10

0.10

86.96 kg

Weight (kg)

Crude Protein

22%

72%

44%

3%

Edited by Abram Bicksler and Rebecca Garofano

Farm-Generated Feed: Fish Feed Production by Keith Mikkelson, Executive Director, Aloha House, Puerto Princesa, Palawan, Philippines

(Editor's Note: Keith has been practicing sustainable farming at the Aloha House Orphanage in Puerto Princesa for many years in order to produce nutritionally dense, farm-derived food that is consumed both at the orphanage and by local consumers. I had the privilege of visiting Keith and his family last March at the Aloha House, where the ECHO Asia/Aloha House Sustainable Agriculture Workshop was held. I was impressed by what they are able to achieve with very few off-farm inputs in a small amount of land area. In this article, Keith will share some of the basics for creating farm-generated fish feed.)

Farm-generated fertility makes agriculture more sustainable. Crop residues and manures are part of the nutrient cycle and can lower input costs through the use of thermophilic composting, vermiculture, bokashi production, or green manures. Farm-generated feeds can also reduce expenses, if farmers manage and utilize the resources already available to them. For, example, farmers might develop pasture using planned grazing for cattle; make hog feed from crop residue and by-products

(such as whey and skim milk); cultivate legume shrubs for cut-and-carry operations for goats; and grow floating ferns and other water crops for fish and poultry.

As densities of livestock increase, the industrious farmer finds ways and means to increase his farm nutrient stream for the benefit of his system. This article will examine the methods and techniques necessary for the smallholder farmer to succeed with farm-derived fish feeds. A farmer should first fully exploit his extensive (and more passive) existing systems, and then consider intensifying his overall operation (Figure 1).

Important Note that many abandon established son at Aloha House.

methods of feed production for a more intensive system without first assessing and then establishing new technologies with a transition period that is well-planned, capitalized and realistic.

Overview of the Aloha System

Planning includes securing both on-farm and off-farm feed sources, in case of contingencies. "Most farmers do not maintain all the ingredients needed to prepare a complete feed on-site or the equipment to blend and pellet it. They must, therefore, have quaranteed primary and alternative market sources at all times, which is not a simple management activity," (Skillicom et al., 1993). Our experience is with the tilapia GIFT variety, Improved Excel variety, and red tilapia from the Bureau of Fisheries and Aquatic Resources in the Philippines, as well as with Japanese koi obtained from commercial breeders in the Philippines (Figure 2). In our closed-loop recirculating aquaponic systems, we also keep

Fish Mea catfish and snakehe Duck Weed tilapia net culture. 7 eat the residual fe and keeping settle Salvania the sump (the a 44% retains water befo Livestock Lime 22% beds or solids Rock Dust Minerals 18% Charcoal - Fine 0%

Feed Sou

Algae B/

For tilapia pond ... free or are in cages, alga-

first feed considered. Ponds with a ... capacity of 3 kg of fish/ square meter can benefit greatly from the addition of fertilizers, which can increase algal bloom and reduce the cost of inputs. Natural fertilizers are used in our system, but commercial fertilizers or purchased worm castings and composts can also be used. However, do plan to utilize farm-generated fertility before considering purchased inputs.

Fish that benefit from algae production (such as tilapia) have a mucus membrane

Feeding Strategies Azolla, Duck Weed, Bulati Some Feed Pelletized Ferments or

journals, papers, and guides (top to bottom) Figure 1. Feeding strategies for fish, ranging from caution against the tendency extensive to intensive. Figure 2. Tilapia being held by Keith Mikkel-

Featured in this AN

- Farm-Generated Feed: Fish Feed Production
- 7 Producing the Biocontrol Fungi Trichoderma and Beauveria

T eECHO Asia Impact Center operates under ECHO, a non-prof t Christian organization that helps you help the poor to produce food in the developing world.

ECHO Asia Impact Center PO Box 64 Chiang Mai 50000 Thailand echoasia@echonet.org www.ECHOcommunity.org

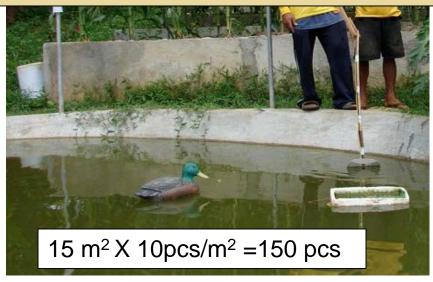
	3.92	Unite 1.25	P/kg
	1.76	T-02.L	P/kg
	0.00 12.24	392.00	1
7	0.00 1.32	72.00 425.00	P
1	0.00 4.40	0.00 F	_
8.0	0.00	0.00 P	
1.00	0.00	0.00 P	Aloha
1.00	0.00	26 P	3) Bo
8.00	0.00	BO P	\vee
.00	00 0.26	P	%
_	28.09	P	280
_	0.80	P	.810
	10.25	P	J.380
	Manganes 14.64	P/kg	0.044
	Iron	P/kg	0.052
	Copper	36	0.004
	Zinc	206	0.021
	Vermicast	ppm	%
	Nitrogen (N)	5100	0.510
	Phosphate (P ₂ O5)	8200	0.820
	Potash (K ₂ O)	2500	0.250
	Manganese	110	0.011
	Iron	678	0.068
	Copper	6.1	0.001
	Zinc	206	0.021
	Bokashi	ppm	%
	Nitrogen	7600	0.760
	Phosphate (P ₂ O5)	5000	0.500
	Potash (K ₂ O)	8100	0.810
	Manganese	50.99	0.005
	Iron	175	0.018
	Copper	3.37	0.000
	Zinc	28.17	0.003
	Calcium	1.41	0.000
	Magnesium	0.16	0.000



Intensive Nursery 10 years

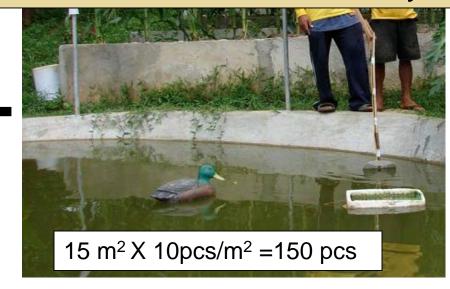


Semi-intensive Fish Pond 7 years



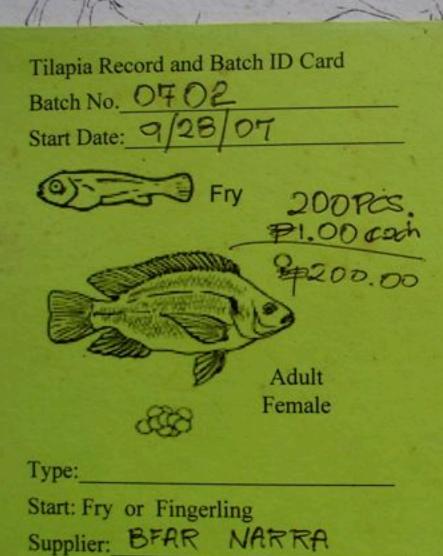


Semi-intensive Fish Pond 7 years









Parem. YES
SOIL: Fertilize / Lime
Weight / Feed Rate / Secci
0 days 19 Sept. 28
21 days 5.5g Oct. 19
42 days 45g Nov. 10
63 days 109 Doc.1
84 days 809 Dcc. 22
105 days Jan. 13
Sickness/Injury/ Mortality
2-01:40pcs 2-02:38pcs
Sale Price:

DAILY RECORD - FERTILER AND SECCION BACK



Mortality No. pcs	
Consumed Wt	
Sale Wt	

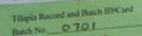
SOW CARD

	B
4	
7 1	

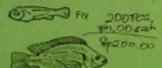
Batch No./Type 701 LR/LW
Birth Date: MARCH 9 2007
Purchase Date: MANDE 68 days
Phase out / Feed: P3,00000

Starting No. pcs. gilt
Mortality No. pcs.
Consumed Wt
Sale Wt.
612 m BREED SEPTEMBER 28, 2007
7mo. October 12, 2007 -> MARCHIA Artificial Insiminition NOV. 17,18,07
@ April 20,21,8
(310) JY Lay 13-14, 200
14/ Vi7.
XI - NN 20, 2018

Record Keeping



Titapia Report and Batch ID Card Burk No. 0402 Start Date: 9/28/07



Female

SOIL: Lening / Line

In TOLK

Weight / Feed Rate / Second 0 days 10 May 31 90 cm

SOIL Fertilize / Lime

Weight / Feed Rate / Secon

0 days by Sapt. 28 21 days 5.50 Oct. 19

42 days 45 9 Nov. 10

63 days 50g Dec-1 84 days 809 Pec-22

Jan. 13 105 days

Sickness Injury / Mortality R-01:4000 2-01:33/KS

Sale Price:



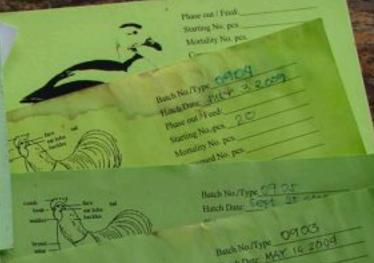
Starting No. pcs. 4 Mortality No. pcs. Consumed Wt.



Baich No/Type 701 Ln/LW Birth Date: MARCH 9 3007 Parchase Date: MAKED 68 days Plane our / Frest P3, 113 22

Starting No. pes Mortality No. pen. Consumed Wt. Sale WL CA-BREED SEPTEMBER 28, 2017 Try October 12 2007 - MARCHA Actipiced Jacim mittien " NEV, 17,0607 O-WILMIN X

1+ - 900 00 2001





Batch Na./Type 0705 P Hach Duc Morch 1G, 2007 Place out Freet Alche Hotched Starting No. pex. 4 Mortality No. pcs. IIII Consumed No. pes. Sale No. pes. 1 Promoted to Layer - No. pes. 1

Had Dat MAY 14 25









UPLB Bee Keepers Dr. Sting

Dr. Cleo Cervancia













Create habitat



Solitary pollinators
Live alone

Carpenter bees Mud wasps

Indigenous

Social insects
Live in colonies

Apis dorsota Apis cerena Apis trigona



ORPINGTON CHICKEN BREEDS

Originally from England. This is a heavy set bird and because of its size is not flighty. They are lovely, docile chickens and therefore make excellent pets as well as a breed for the novice chicken keeper. Orpingtons lay 220 - 240 eggs a year, making it another good breed for egg layers.

Broody
Gentle
Ideal for the novice



LEGHORN CHICKEN BREEDS

These are probably the best laying chickens around, besides the Rhode Island Breeds. They are prolific egg layers of white eggs. A small, spritely, noisy bird with great style, Leghorns like to move about. They are good foragers and can often glean much of their diet from ranging over fields and barnyards. Leghorns are capable of considerable flight and often roost in trees if given the opportunity.

Leghorns lay more than 300 eggs a year.



AUSTRALORP CHICKEN BREEDS

An Australian bird developed from the Orpington chicken. Black feathers with a green sheen. Can lay from as early as 5 months. Australorps lays about 300 eggs a year, so another good layer for chicken eggs.

Dual Purpose Hardy Good Choice for Novice Breeder



LIGHT SUSSEX CHICKEN BREEDS

The Sussex is an attractive little bird and makes a good allround farm fowl. It is a good layer of cream eggs. 260-280 eggs per year. So not a bad egg layer.

Best Dual Purpose Bird Good Foragers Tend to go Broody



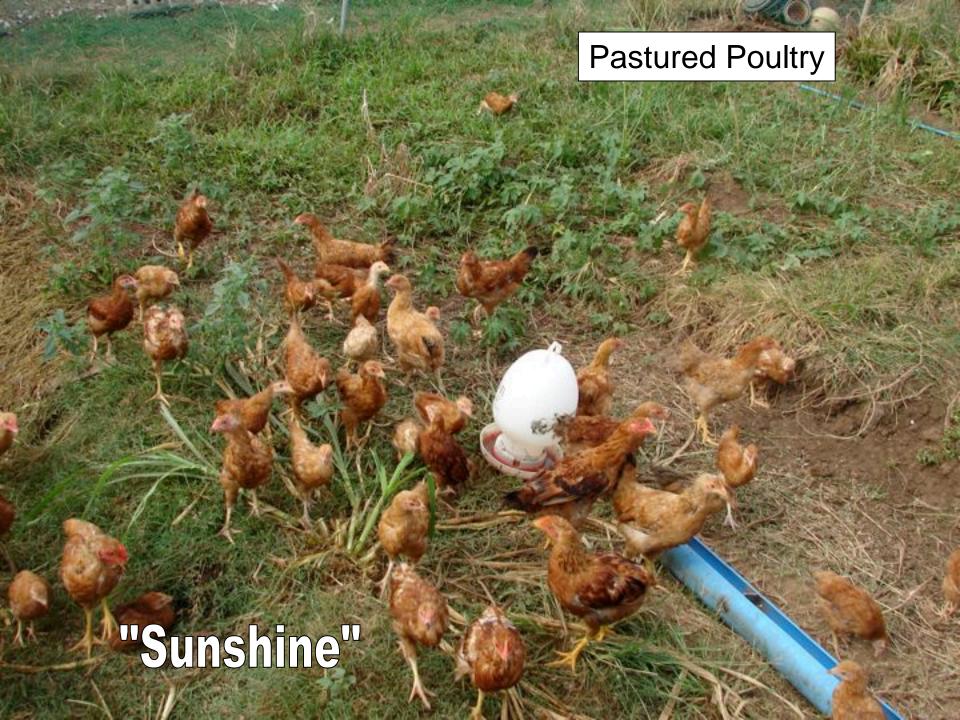
RHODE ISLAND RED CHICKEN BREEDS

The Rhode Island Red Chickens are prolific egg layers of medium brown eggs. Relatively hardy, they are probably the best egg layers of the dual purpose breeds. Reds handle marginal diets and poor housing conditions better than other breeds and still continue to produce eggs. 200–250 eggs a year.

Dual Purpose Bird Hardy Good Choice for Novice Breeders







The Hybrid Challenge



Fast Growing / Strong bones

F1

Hybrid Pedigree



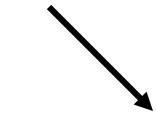


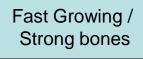
Strong bones male

Breeders

female

Fast Growing



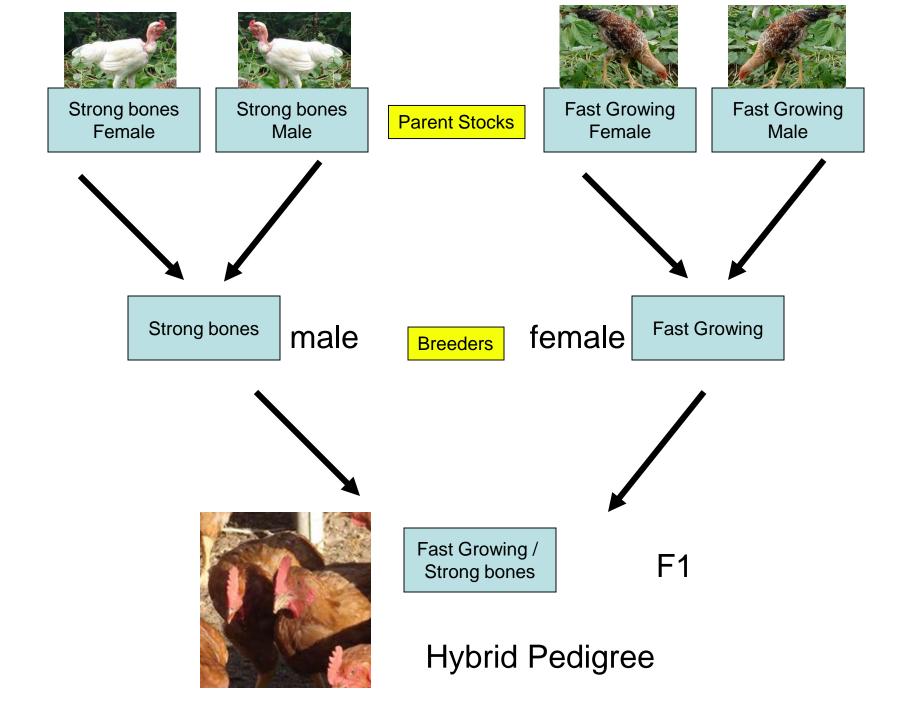




F1



Hybrid Pedigree



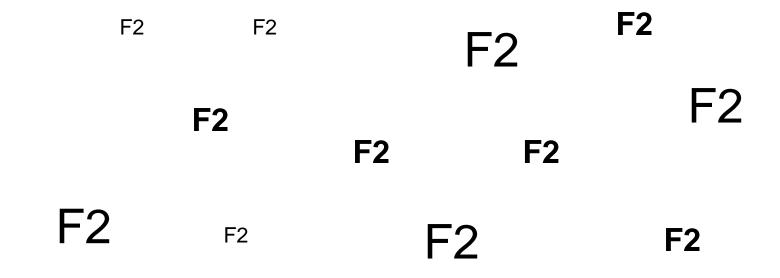
The Hybrid Challenge

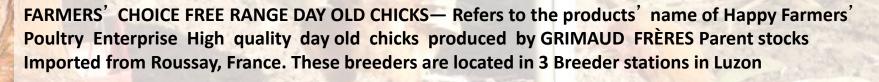


Fast Growing / Strong bones

F1 X F1 = F2

Hybrid Pedigree





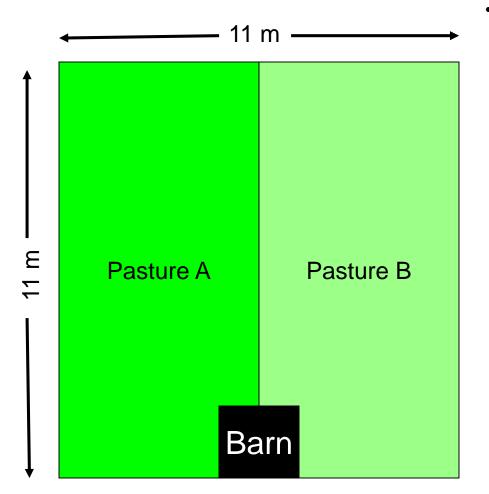
GRIMAUD FRÈRES – The genetic supplier from Roussay, France that supplies the Parent stock Breeders of colored chicken. The company also supply Pekin ducks, Geese, Hybrid Rabbits, Guniea Fowl and Hybrid pigeons worldwide. GRIMAUD Company also owns HUBBARD international.



Pastured Poultry

Rotational Grazing 100 birds

1-14 days Brooder only 15-28 days Brooder/Pasture 29-52 days Pasture A 53-70 days Pasture B



CLASSIFICATION: SLOW GROW FREE RANGE

- •Slow growing system with 30% high density feeds and 70% low density feeds and legumes
- •Expected average live weight of 1.5 kilos at 70 days!
- •Housing 14 m² per 100
- •Range 100 m² per 100

114 m² per 100

© HAPPY FARMERS' ®
CHOICE FREE RANGE
MEAT CHICKEN

COMMERCIAL FEEDS

Ag	AV. WEI	FEEDS/DAY/BIRD	EST R
7 s	125 GRAMS	26 GRAMS	1
14 /s	250 GRAMS	% GRAMS	0.
21 s	425 GRAMS	SAMS	1
28 d	550 GRAMS	47 G	1
35 da	750 GRAMS	62 GRAM	24
42 days	910 GRAMS	70 GRAMS	1.52
49 days	15 PAMS	83 GRAM	1.88
56 days	1650 Gm	Clym	2.20

ALOHA NATURAL FEEDS TM
70 days 1500 GRAMS

		200
Vaccin	nation / Health supplement program	Set War
AGE	PARTICULARS	
1	Bamboo leaves and Brown rice supplement	A CONTRACTOR OF THE PARTY OF TH
2-6	Banana and watermelon supplement	
7	NCD B1-B1 strain thru eyedrop - Please refer	to proper vaccination method
8-10	Herbal 1 water supplement	
11-14	Plain water	
15-17	Plain water	3% mortality w/
18-20	Herbal 1 water supplement	
21-23	Plain water	New Castle vaccinte
	Herbal 2 water medication supplement	
28	NCD LA SOTA MEDICATION THRU WAT	ER – Please refer to proper
View	vaccination method	
29-31	Plain water Value	
32-38	Plain water	
39-42	Herbal / Vegetable feed additive	
43-46	Herbal / Vegetable feed additive	
47-50	Herbal / Vegetable feed additive	
52-55		
56-60	Herbal / Vegetable feed and water additive	

Batch	ı 1 Bir	rd Cost									
Labo	r			feed	feed				total bird		
P/hr	r hr	s labor tota	al birds	s cost	total	Chicks	cost	t chicks total	cost		
× //	30 9	2,70	0 8	60	4,800	100	4	5 4,500	12,000		
Clean	ning /	packaging	Cost								
#				Whiz/		Whiz/					
peop			labo			gas		Cleaining	TOTAL		
	ne hr				birds	total		cost total			
	3.0 5	<mark>.3</mark> 3	0 1,26	0 11	70	770		2,030	14,030		
INCO											
	#			CO PETER SEA						5 5:4:1	
Dress				Total		Amortiz			Net	Profit/bird	
Kilos			•	Income		ation			INCOME	in PESO	State A
	6 7	70 10	9 19	5 21,158		1,500			5,628	56	40.11%
Batch 2	Bird	Cost									
Labor				feed	feed				total bird		
P/hr	hrs	labor total	birds	cost	total	Chicks	cost	chicks total	cost		
30	70	2,100	100	60	6,000	100	45	4,500	12,600		
Cleaning	g / pa	ckaging C	ost								
#				Whiz/		Whiz/					
people			labor	gas/		gas		Cleaining	TOTAL		
on line	hrs	rate	total	bird	birds	total		cost total	COST		
4.0	8.0	30	960	11	70	770		1,730	14,330		
INCOME											
AVG.											
Dressed		total	602	Total	1 9	Amortiz			Net	Profit/bird	
Kilos	S		LAN FAMILIE	Income		ation			INCOME	in PESO	
1.6	97	150	195	29,318		1,500		1 /	13,488	135	94.13%
Ava Liva	\A/+ 1	EEV							11/1/2011		

Ave Live Wt 1.55K

Dressing percentage 76% [1.1K]
Mortality 3%











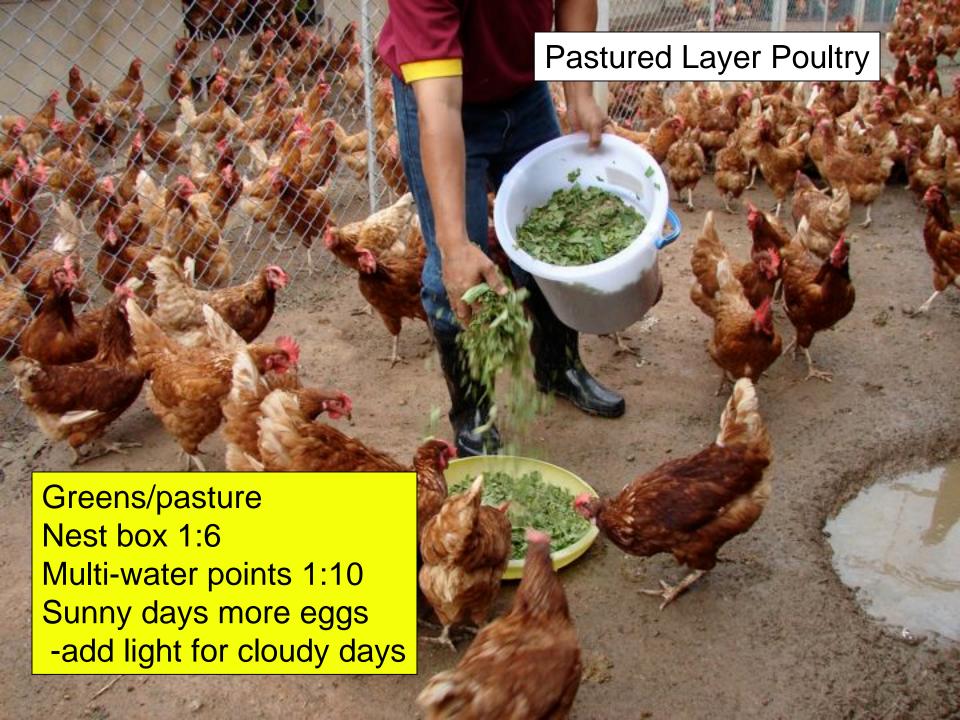










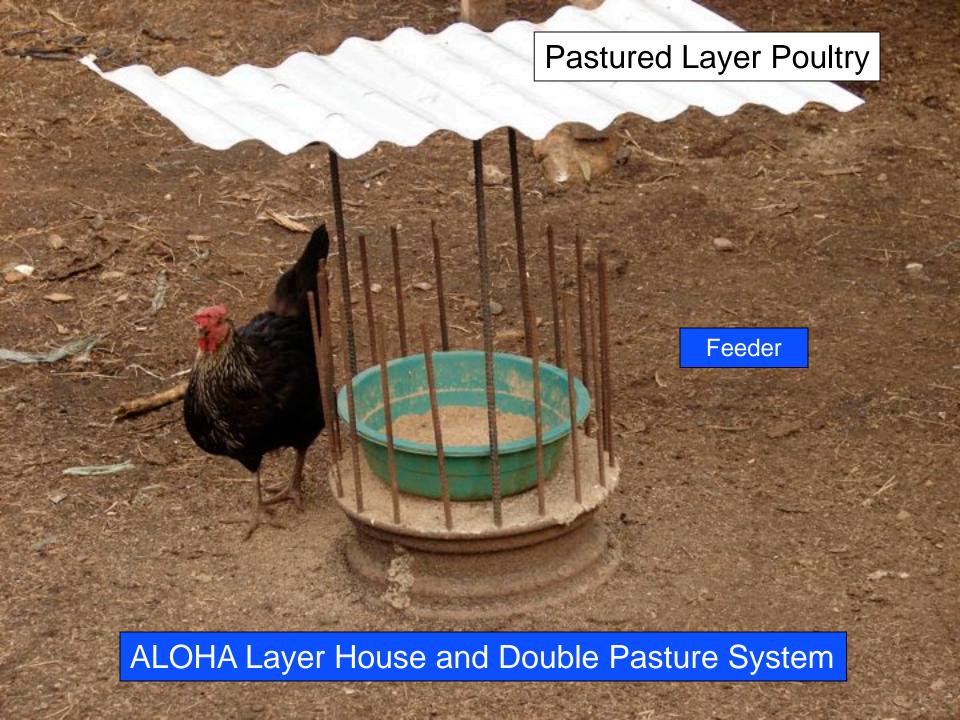




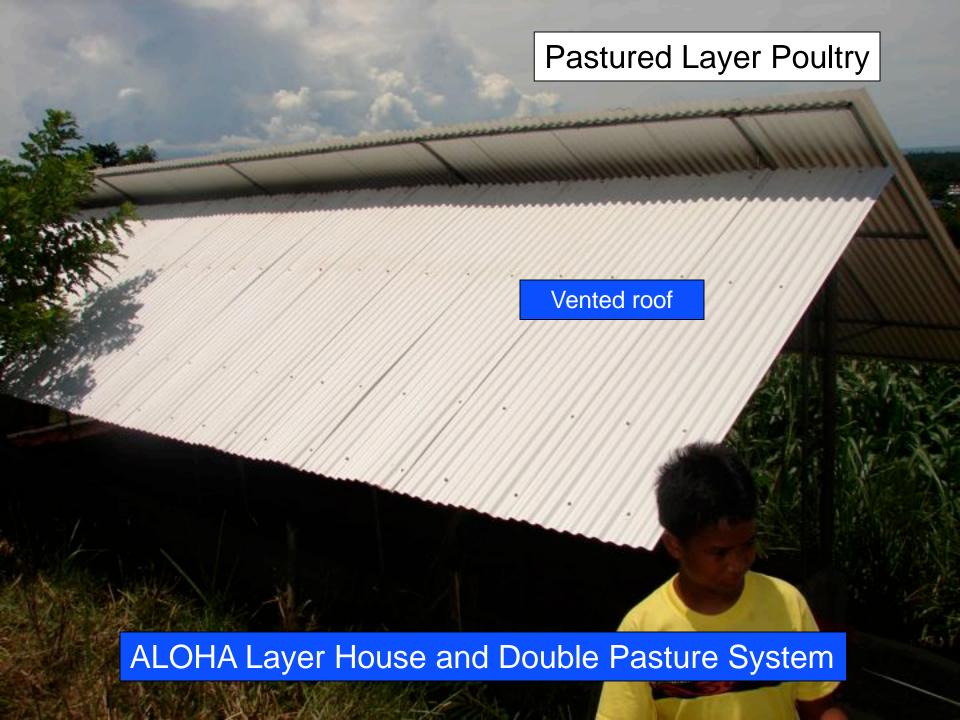




















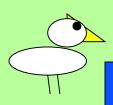






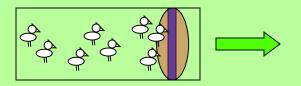


Feeder mounted in front only, overlap feed zone from previous day

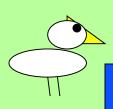


ALOHA ® Patented © Whizbang Chicken Sled™

Feed spill zone



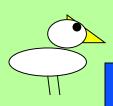
Feeder



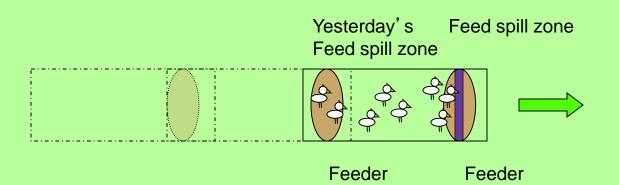
ALOHA ® Patented © Whizbang Chicken Sled™

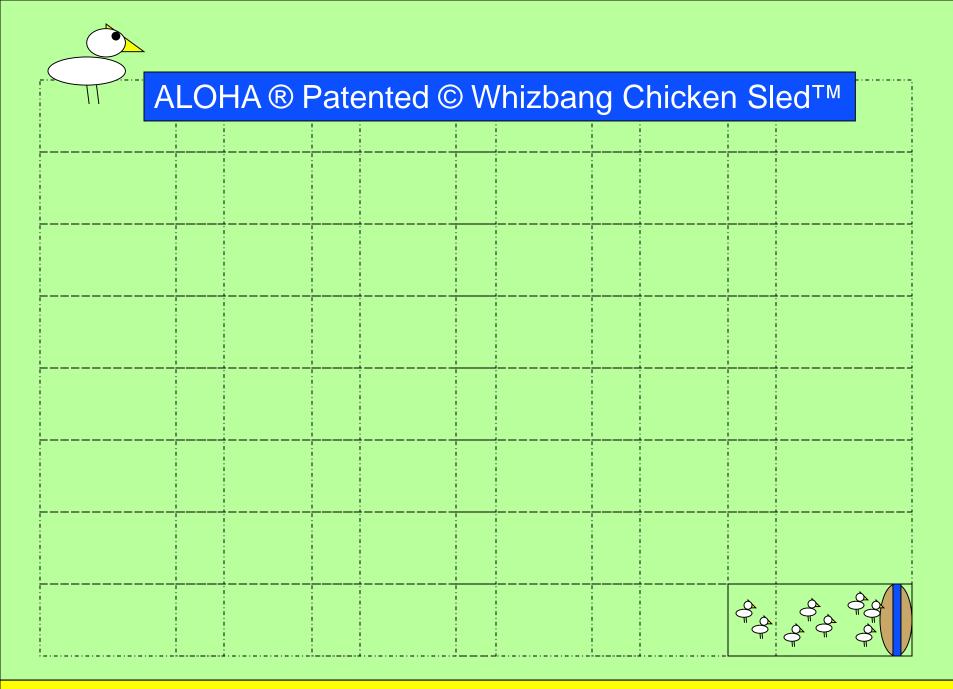
Yesterdays Feed spill zone Feed spill zone

Feeder



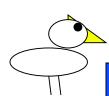
ALOHA ® Patented © Whizbang Chicken Sled™



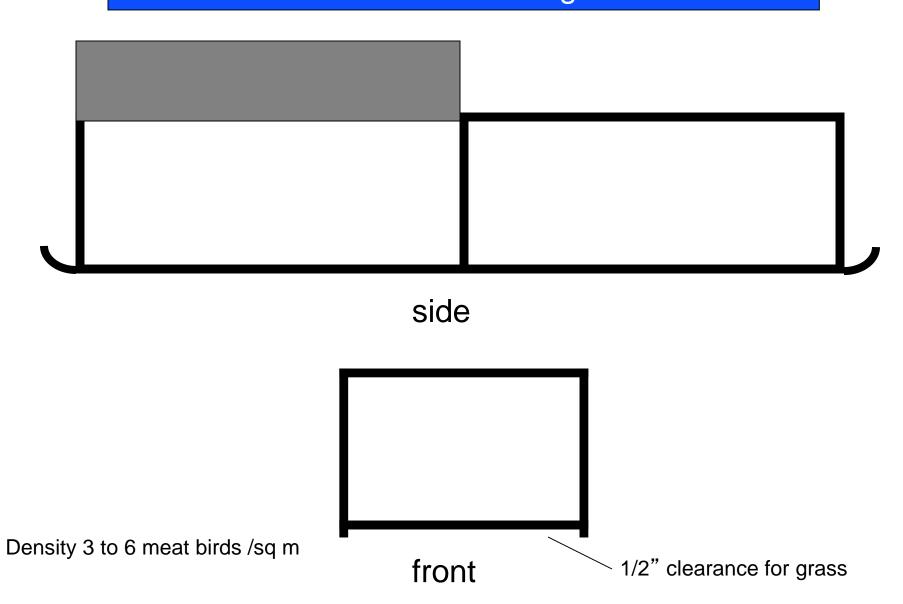








ALOHA ® Patented © Whizbang Chicken Sled™













Chicken Feed Layer (2 Liter Scoop) Goats & cows Scoop Bokashi B (w/o tae) cut and carry/pasture Supplement only Scoop Copra 3% min. Scoop Fish Meal Scoop Corn Grits Scoop Tiki Tiki Ferment 2 weeks Table Sp Sea Salt or rock dust 10 L D1 10 L Copra Table Sp Livestock Lime **EM Bokashi B** 50 ml Molasses 50 ml EME (Hog Feed) 100 ml uling Ducks Fish Cakes 50% Bokashi B 50% Bokashi B 50% Fish meal 25% Fish meal 25% chopped greens

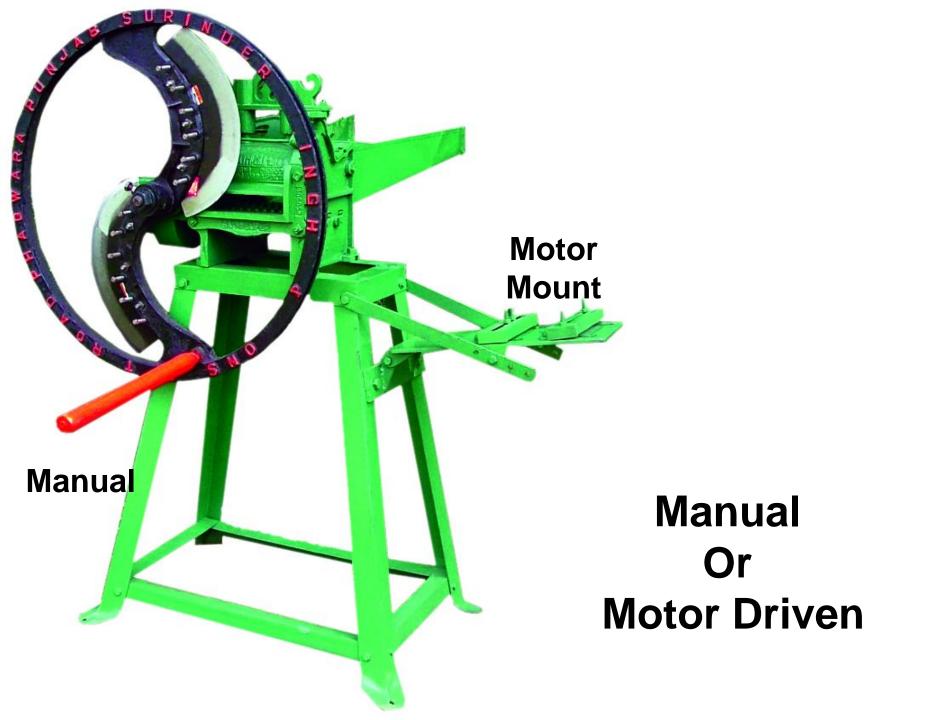


Scientifically Formulated Excel Spread Sheet Balanced Protein

Chicken Feeds

Starter	DAYS				
	Crude Protein	Cost P/ 50K sack	Cost P/ Kilo		
B Meg Starter	19.00%	1,100.00			22.00
Fermented EM Feed	19.16%	625.67			12.51
<u>Formula</u>					
	Crude Protein	Weight (K)	Cost P/Kilo	CP Units	COST (Pesos)
Tiki Tiki	14.0%	2.00	8.00	0.28	16.00
Copra Meal	22.0%	2.00	8.00	0.44	16.00
Fish Meal	40.0%	2.00	20.00	0.80	40.00
Corn Grits	7.0%	2.00	20.00	0.14	40.00
Hog Feed	14.0%	2.00	8.00	0.28	16.00
Livestock Lime	0.0%	0.02	8.00	0.00	0.16
Rock Dust Minerals	0.0%	0.02	2.00	0.00	0.04
Charcoal-fine	0.0%	0.03	1.00	0.00	0.03
Fish Sliage (FAA)	33.0%	0.20	6.00	0.07	1.20
EM & Molases (each	100ml/10 Liters)	0.20	8.00		1.60
		10.47		2.01	131.03

















Why Grass-Fed is Best

More Fat-Soluble Vitamins – A, D, E, K - in the fat.

More CLA - anti-cancer & weight loss compound - in the fat.

More minerals - mostly in the fat.

To get the benefits of grass feeding... you must eat the fat!

And I will send grass in thy fields for thy cattle, that thou mayest eat and be satisfied.

Deut 11:15



NUTRIENT DENSE FOOD AND MAXIMUM HEALTH

Grass Insects Chicken Livers Fish Meal Cracked Corn Poisoned Poison Free Grains **Organic Grains** Conventional **Pasture Raised Organic**

Liver: No food higher in nutrients

Per 100 g	Apple	Carrots	Red Meat	Liver
Phosphorus	6 mg	31 mg	140 mg	476 mg
Iron	.1 mg	.6 mg	3.3 mg	8.8 mg
Zinc	.05 mg	.3 mg	4.4 mg	4.0 mg
Copper	.04 mg	.08 mg	.2 mg	12 mg
Vitamin B2	.02 mg	.05 mg	.2 mg	4.2 mg
Vitamin A	0	0	40 IU	53,400 IU
Vitamin C	7 mg	6 mg	0	27 mg
Vitamin B6	.03 mg	.1 mg	.07 mg	.73 mg
Vitamin B12	0	0	1.84 mg	111.3 mg

Eat liver fried, grilled, with bacon, in sausage, pate and liverwurst.



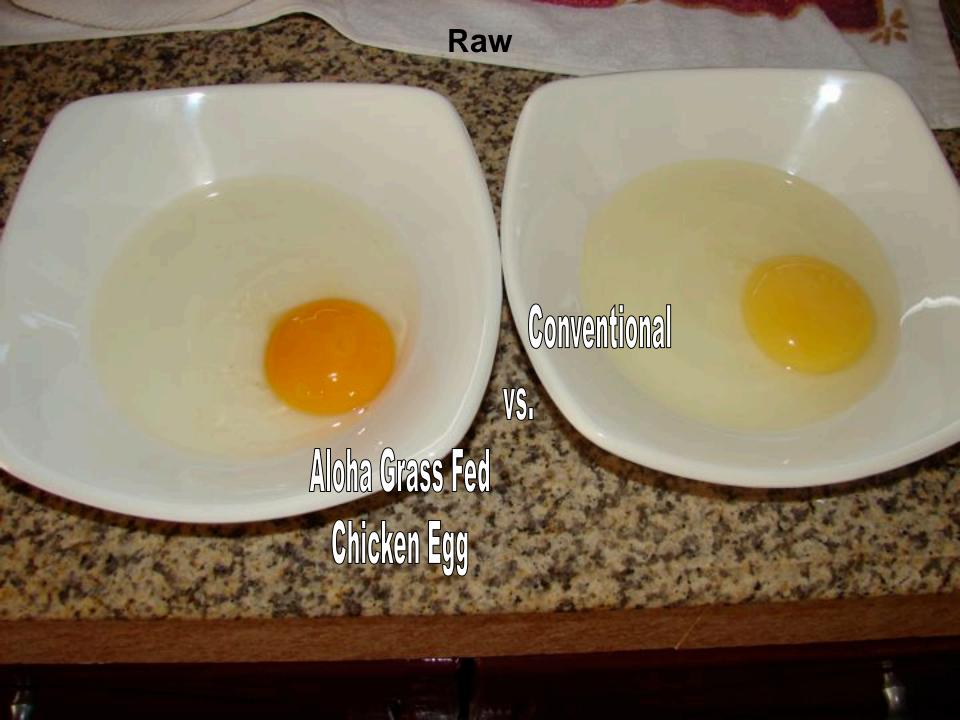




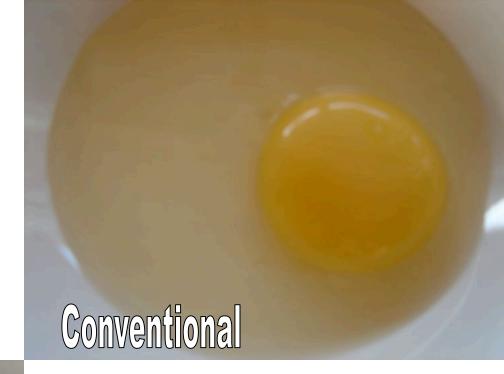








Conventional
2 distinct parts
Yolk
White

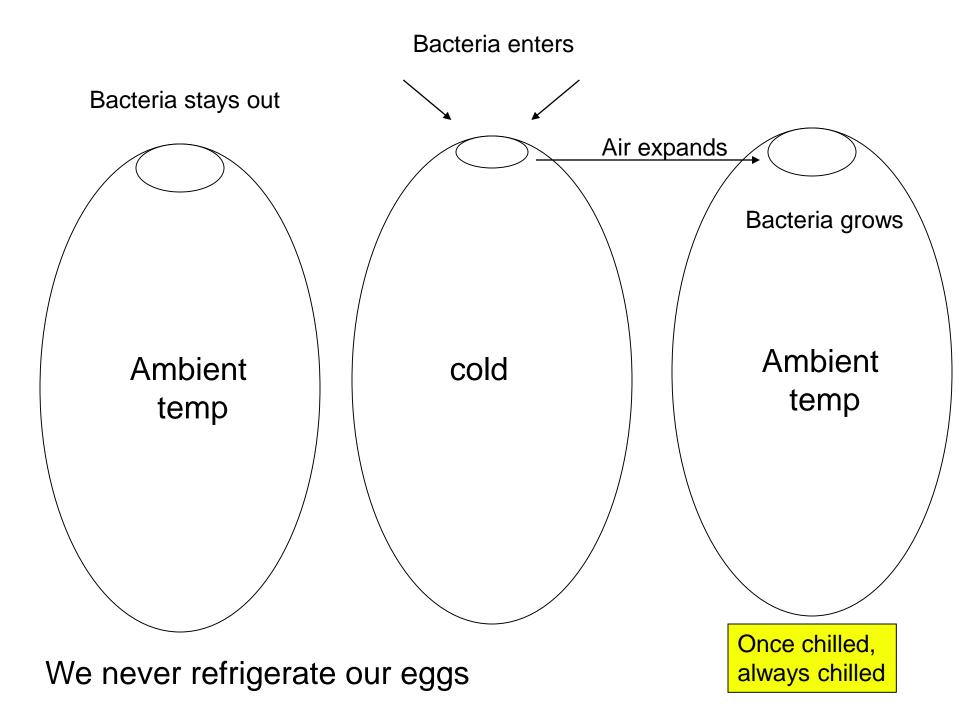




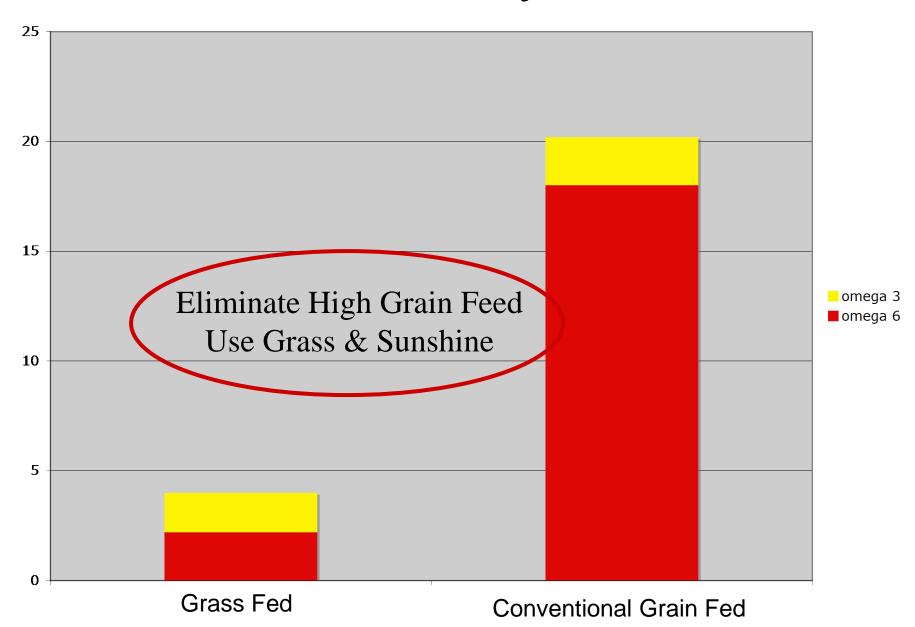
WS.

Grass fed
3 distinct parts
Yolk
Protein
White



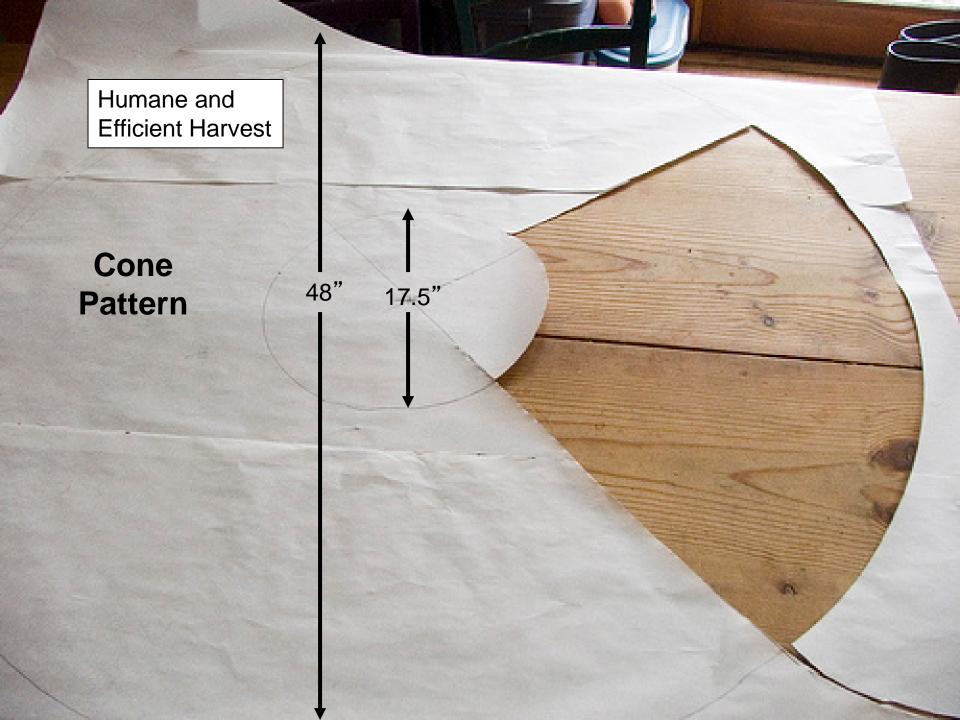


Essential Fatty Acids

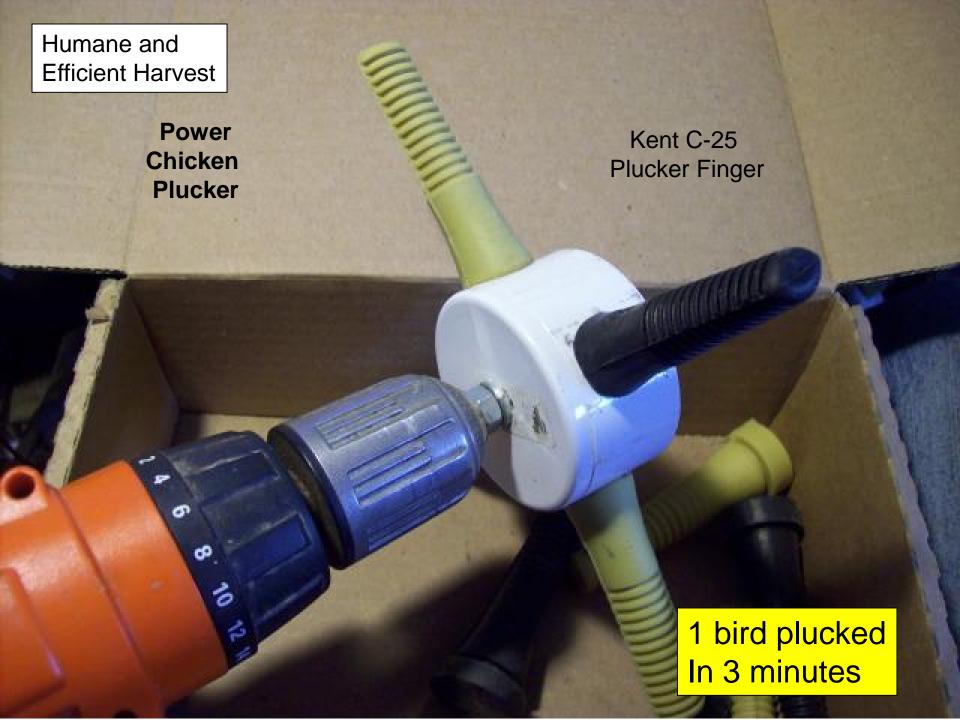








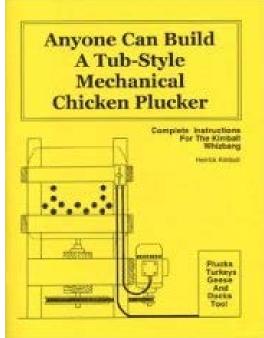








Whizbang Chicken Plucker







































EM Livestock

Goat



EM Claims

- Boosts stomach flora
- 2. Prevents worms
- 3. Probiotic
- 4. Increases digestible protein
- 5. Minimizes odors
- 6. Increases fertilizer value
- 7. Prevents ammonium build up













Feed

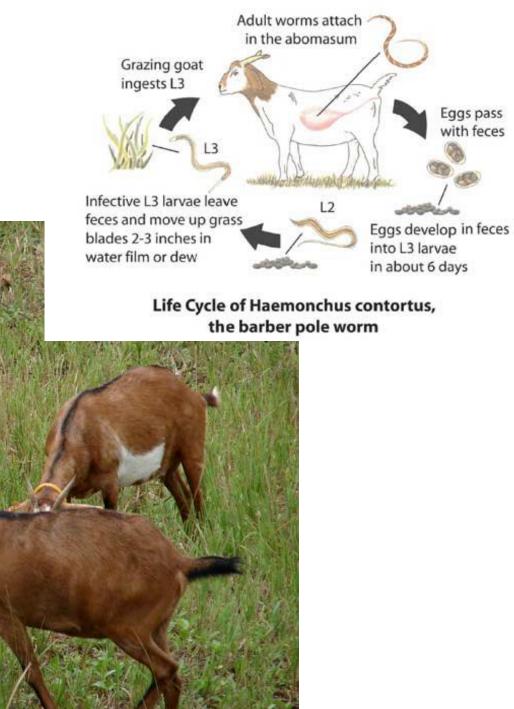
- Cut and carry
 - Labor
 - Fodder crops
- Concentrate
 - expensive
- Pasture
 - Parasites AM













































Housing

- Mud floor
 - disease
- Cement floor
 - hygiene
- Sawdust
 - Maintenance
- Wood slotted floor
 - Maintenance
- Plastic slotted floor
 - Maintenance















It's up to you now



- 1. Assess resources
- 2. Make a workable plan
- 3. Start using EM
- 4. Do the 10 Fundamentals
- 5. Come back for more training





Alumni now qualify to return for hands on experience!