

## AQUAPONICS KEY RATIOS FOR MEDIA GROW BED

1. Use these ratios to guide you in your aquaponics decisions. Try using them for a start.
2. 1 SQ FT of media grow bed requires 0.5 kg of fish.
3. 1 sq m of grow bed is 11 sq ft and hence needs 5 kg of fish. Look at fish by weight and not just by the number of fishes eg 10 fishes weighing 500 gram each is the same as 50 fishes weighing 100 gram each. Total weight of the fishes is more important than the number of fishes.
4. SINCE WE HAVE THREE GROW BEDS WE NEED 15 KG OF FISH.
5. Fish tank volume determines the number of fishes. 0.5kg of fish for 20 to 26 litres of water. Our fish tank is 1,000 litres and so we should have between 50 to 40 fishes. Again this can depend on the size of the fishes. For small fishes weighing less than 200 grams we can have more fishes.
6. Ammonia and nitrites level should be less than 0.75 ppm. If the levels exceed this figure they fishes MAY die.
7. Nitrates can rise as much as 300 ppm without any fish dying.
8. Leafy green plants: 20-25 plants per square metre. Leafy plants are Choy Sim, lettuce, rocket etc
9. Fruity plants is 4 plants per square metre. Fruity plants are cucumber, lady fingers, tomatos, corn etc
10. Fish (mature) eat 1 to 2 % of body weight per day.
11. 1% of 15 kg is 150 grams per day. We need 150 to 300 grams of fish feed per day for three grow beds to feed the fishes.
12. Fry ( very small) tilapias takes 5 to 30% of body weight of fish feed per day
13. Fingerlings tilapias ( about 1 inch long) takes 10 to 15% of body weight of fish feed per day
14. Juvenile tilapias ( about 2 inches long)takes 5 to 10 % of body weight of fish feed per day
15. Market size tilapias ( about 5 to 6 inches long) eat 2 to 5% of body weight of fish feed per day.
16. Nile tilapias grow to 600 grams in 6 to 8 months
17. Another organisation Rakocy recommends a lower amount of fish feed.
18. Rakocy/UCI specify feeding rate of 60 to 100 grams of fish feed per sq m of grow bed for 15 kg of fish.
19. Leafy vegetables will take 60 grams and fruity vegetables takes 100 grams of fish feed per day for 15kg fish. Based on 1% of weight of fish, this means we need only 6kg of fish and not 15 kg for leafy vegetables and 10 kg of fish for fruity vegetables.
20. Try and calculate how heavy the fish will grow each month.
21. Determine fish weight. Conversion ratio is 1.4. this means for every 1.4kg of fish feed, the weight of the fish will increase by 1 kg.
22. Here is how the tilapias should grow.
23. Fingerlings takes 10% of body weight daily. Assume each fingerlings weighs 10 grams
24. We feed them 1 gram per day or 30 grams per month. Divide by 1,4 is 21 grams growth. This means the tilapia will be heavier by 21 grams after one month.
25. After one month fingerling tilapias weighs 10 plus 21 grams or 31 grams
26. Juvenile tilapias takes 5%. 5% of 31grams is 1.55 gram per day or 46.5 grams per month
27. Conversion is 1.4, 46.4 divide by 1,4 is 33 Grams.The tilapia will be heavier by 33 grams
28. Second month fish becomes 31 plus 33 grams 64 grams
29. Adult tilapis is 2%. 2% of 64 grams is 1.28 grams per day or 38.4 grams per month
30. Divide by 1.4 is 27 grams. the tilapia will be heavier by 27 grams.
31. Third month fish weight is 64 plus 27 =91 grams
32. 2% of 91grams is 1.82 grams or 54.6 gramsper month
33. 54.6 divide by 1.4 is 39 grams . Fish s heavier by 39 grams
34. Fish is 91 + 39 =130 grams in month 4
35. Month 5 is 130 grams plus 55 is 185 grams
36. Month 6 the fish will weigh 185 plus 79 grams or 264 Grams
37. Month 7 the fish will weigh 264 plus 113 or 377 grams
38. However if we start the fingerling tilapias at 30 grams instead of 10 grams, then after 5 months the tilapia will weigh 555 grams ( ready to sell in market)

## Sample of reports on our Aquaponic Experiment

From 2016 May 11

	Date	Day	PH	Ammonia	Nitrite	Nitrate	Remarks
Week 1	42502	Thu	7.6	0	0.25	5	
	42503	Fri	7.6	0.25	0.25	0	
	42504	Sat	7.6	0.25	0.25	5	
	42505	Sun	7.6	0.5	0	5	
Week 2	42506	Mon	7.6	0.25	0	5	
	42507	Tue	7.6	0.25	0	5	3 tilapias added (from 1st batch)
	42508	Wed	7.6	0.25	0.25	5	12 new tilapias added (bigger size in 2nd batch). Oxygen 4
	42509	Thu	7.6	0.25	0.25	5	
	42510	Fri	7.8	0.25	0.5	10	Started to use high range test for PH
	42511	Sat	7.8	0	2	5	Accidental addition of 3 capfuls Seasol. 1 tilapia died. Oxygen 4
	42512	Sun	7.4	0.25	5	10	1 tilapia died. Addition of Seasol suspended. Oxygen 4
	42513	Mon	7.8	0	2	10	Sump overflowed as dumping sequence was altered. Topped up with tap water
Week 3	42514	Tue	7.8	0	5	10	3 tilapias died
	42515	Wed	7.8	0	2	10	2 tilapias added from 1st batch. Resumed daily capful Seasol addition.
	42516	Thu	7.8	0	2	10	
	42517	Fri	7.8	0	2	10	
	42518	Sat	7.8	0.25	0.5	5	Oxygen 6
	42519	Sun	7.4	0	1	10	Oxygen 4
	Week 4	42520	Mon	7.8	0	0.5	5
42521		Tue	7.8	0	0	5	
42522		Wed	7.8	0	0	10	
42523		Thu	7.4	0	0	5	
42524		Fri	7.4	0	0	5	
42525		Sat	7.7	0	0	10	oxygen 6
42526		Sun	7.4	0.25	0	10	oxygen 4
Week 5		42527	Mon	7.7	0	0	10
	42528	Tue	7.8	0	0	10	Added 30 new fingerlings.
	42529	Wed	7.8	0	0	10	
	42530	Thu	7.8	0	0	10	4 fingerlings died. Added 25 tilapias of 4" length (total weight 600 grams)
	42531	Fri	7.4	0.25	0	5	3 fingerlings died. Added 30 more fingerlings. Did salt bath n installed aerator to tank
	42532	Sat	7.4	0	0	5	O2: 4; 6 fingerlings died
	42533	Sun	7.4	0	0	5	O2: 4; 2 fingerlings died
Week 6	42534	Mon	7.4	0.25	0	10	O2: 6; 1 fingerling died, added 2 big tilapia in tank
	42535	Tue	7.4	0.25	0	10	O2: 6; 2 fingerlings died
	42536	Wed	7.2	0	0	20	O2: 6, 1 fingerling died

	42537	Thu	7.2	0.25	0	10	O2: 4; GH 5; KH 7, 1 big tilapia + 2 fingerlings died
	42538	Fri	7.2	0.25	0	20	O2: 4; 6 fingerlings died
	42539	Sat	7.2	0.25	0	40	O2: 6; 3 fingerlings died
	42540	Sun	7	0.25	0	40	O2: 6; 1 fingerling died
Week 7	42541	Mon	7	0.25	0	40	1 fingerling died; stopped adding Seasoil

