

**Purchasing Channel Catfish Fingerlings**  
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It is important to purchase the best available catfish fingerlings when stocking commercial production ponds. Poor quality fingerlings can result in severe economic losses because of delayed harvesting, underestimated stocking weights and disease transmission to fish already present in the pond. Fingerling quality is judged on grading, strain, health and the supplier's reliability. Once fingerlings are purchased, they must be transported with the least amount of stress possible.

**Grading**

Fingerlings raised in large nursery ponds vary considerably in length and weight. Fingerlings that are sold without being graded are referred to as "pond-run." If "pond-run" fingerlings average 5 inches, a large proportion will be less than 4 inches and some will be much larger than 6 inches. Those fish less than 4 inches will probably not reach market size in a single growing season. Fingerling producers can improve the quality of their product by grading with live cars (socks) or seines with a mesh size that retains fish of a certain minimum size (Table 1). The additional cost of graded fingerlings is a worthwhile investment. Refer to: <http://agpublications.tamu.edu/pubs/efish/391fs.pdf>

**Table 1.** Net mesh sizes and box grader bar spacing required to grade channel catfish fingerlings.

Approximate Fingerling Size Retained		Square Mesh Size	Spacing between Bars
(Inches)	(Lbs./1000 fish)	(Inches)	(Inches)
8	1333	1	62/64
7	91.0	3/4	56/64
6	58.8	5/8	48/64
5	35.3	1/2	40/64
4	19.1	3/8	32/64
3	8.8	--	27/64
1-2	1.6	1/4	--

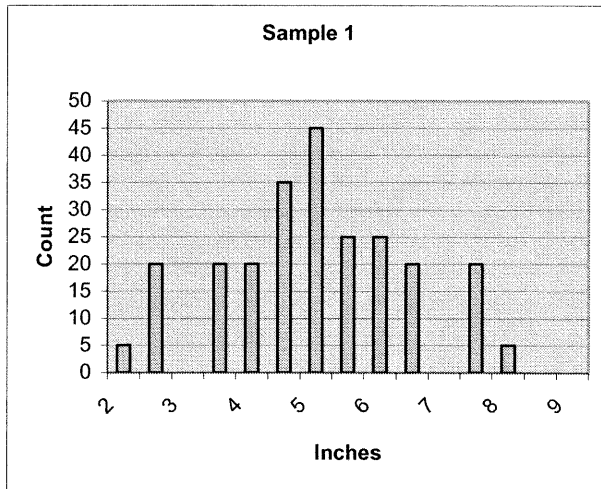
Channel catfish fingerlings are sold either by the inch or by the pound. Therefore, an accurate estimate of fish number and/or length is critical when purchasing or selling fingerlings. Over the years, at least a half-dozen length-weight tables have been developed to estimate numbers of channel catfish. Many discrepancies can be found between these tables because they were derived from fingerling samples from different populations.

To eliminate confusion, researchers at Mississippi State University collaborated with a number of catfish fingerling producers to develop a "standardized" table. This table represents an industry-wide "best estimate" of channel catfish fingerling length-weight relationships (Table 2). The standardized chart was developed in 1991 and has been adopted by a number of producer associations including the Louisiana Catfish Farmers Association, the Catfish Farmers of Mississippi, the Catfish Farmers of Arkansas and the Catfish Farmers of America.

**Table 2.** Composite length-weight catfish fingerling chart, Mississippi State University, 1991.

Length (inches)	Weight (lbs/1000)		Length (inches)	Weight (lbs/1000)
1.0	0.7		5.1	37.3
1.1	0.8		5.2	39.3
1.2	1.0		5.3	41.5
1.3	1.2		5.4	43.7
1.4	1.4		5.5	46.0
1.5	1.6		5.6	48.4
1.6	1.8		5.7	50.9
1.7	2.1		5.8	53.4
1.8	2.4		5.9	56.1
1.9	2.8		6.0	58.8
2.0	3.1		6.1	61.6
2.1	3.5		6.2	64.5
2.2	4.0		6.3	67.5
2.3	4.4		6.4	70.6
2.4	4.9		6.5	73.7
2.5	5.5		6.6	77.0
2.6	6.1		6.7	80.4
2.7	6.7		6.8	83.8
2.8	7.3		6.9	87.4
2.9	8.1		7.0	91.0
3.0	8.8		7.1	94.8
3.1	9.6		7.2	98.6
3.2	10.4		7.3	102.6
3.3	11.3		7.4	106.7
3.4	12.3		7.5	110.8
3.5	13.3		7.6	115.1
3.6	14.3		7.7	119.5
3.7	15.4		7.8	124.0
3.8	16.6		7.9	128.6
3.9	17.8		8.0	133.2
4.0	19.1		8.1	138.2
4.1	20.4		8.2	143.1
4.2	21.8		8.3	148.2
4.3	23.2		8.4	153.4
4.4	24.8		8.5	158.7
4.5	26.3		8.6	164.1
4.6	28.0		8.7	169.7
4.7	29.7		8.8	175.4
4.8	31.5		8.9	181.2
4.9	33.3		9.0	187.1
5.0	35.3			

To accurately calculate the number of fish and the number of inches of fish being purchased, an average length and an average weight must be available. A length-weight relationship is only valid to predict one single value or the other, and only for an individual fish. An average length for a sample of fish cannot be used to predict their average weight, or vice versa. The number of fish and the number of inches being purchased will always be overestimated if averages are converted rather than calculated, because the relationship between length and weight is not a straight line. A fish that is 50% longer than another will not be 50% heavier, but anywhere from 230% to 320%, based on the values in Table 2. The more size variability within a sample of fish, the greater the overestimation error(s) will be.

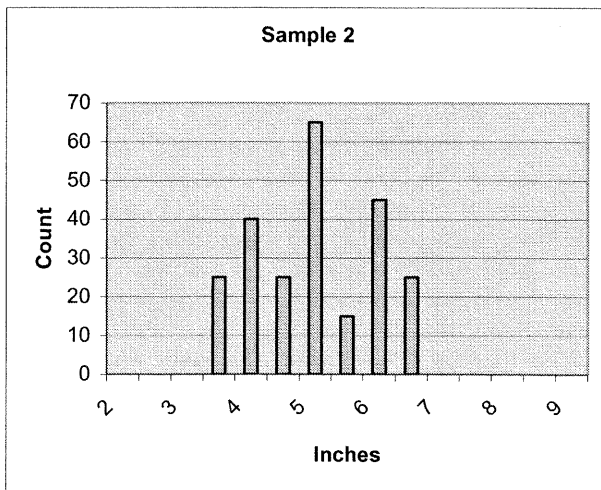


**Sample 1:** A sample size of 240 fish.  
Total Weight of Sample: 10.26 lb.

**Average Length: 5.0 inches**  
**Average Weight of fish: 0.0427 lb.**  
**Actual number of fish per 1000 lb.: 23,394**  
**Actual number of inches per 1000 lb.: 116,970**

Avg. Lt. Converted from Weight: 5.34" inches  
Avg. Wt. Converted from Length: 0.0353 lb.  
Projected number of **fish** per 1000 lb.: 28,329

Projected number of **inches** per 1000 lb.  
with only average length from sample: 141,643  
with only average weight from sample: 124,924



**Sample 2:** A sample size of 240 fish.  
Total Weight of Sample: 9.23 lb.

**Average Length: 5.0 inches**  
**Average Weight of fish: 0.0384 lb.**  
**Actual number of fish per 1000 lb.: 26,011**  
**Actual number of inches per 1000 lb.: 130,053**

Avg. Lt. Converted from Weight: 5.14" inches  
Avg. Wt. Converted from Length: 0.0353 lb.  
Projected number of **fish** per 1000 lb.: 28,329

Projected number of **inches** per 1000 lb.  
with only average length from sample: 141,643  
with only average weight from sample: 133,695

In sample 1 above, a total of 240 fish were taken from a load of 1000 lb of fingerlings. The actual average length of the fish was 5.0 inches, and the variability in length is illustrated in the bar chart. The actual average weight of the 240 fish sampled was 0.0427 lb. Using the actual average weight, the total number of fish in a 1000 lb load is calculated to be 23,394. Using this number and the actual average length of 5 inches, the total number of inches in the 1000 lb load is 116,970. If fingerlings are selling for a cent-and-a-half per inch, the value of the 1000 lb load

should be \$1,754.55. If only an average weight was available for the sample of 240 fish, there would be no way to make a valid estimate of their average length and calculate the number of inches being purchased. If the length-weight table were used to “convert” the average weight into an average length, the value from the table would be around 5.34 inches, an overestimate of 6.8 percent, which is carried over into the calculation of the total inches purchased (\$1,873.86).

Even bigger problems arise if only length measurements are used to estimate fish size and weight. If only length measurements were available for the sample of 240 fish in example 1, the actual average length of 5.0 inches would still be calculated, but if this value were “converted” using the length-weight table into an average weight of 0.0353 lb per fish, a number of mathematical problems would result. Underestimating the weight of the individual fish would result in an overestimate of the total number of fish in the 1000 lb load, and the total number of inches being bought and sold. Example 2 illustrates how these mathematical problems are still present, but reduced to some extent, when individual fish are less variable in size. If only length data can be collected, the length for each fish must be individually converted into an expected weight, and these expected values must then be used to estimate the expected average weight. Only when all fish are the same size is it possible to convert an average length to an average weight.

### **Strains**

A strain is a subgroup of a species that has a common history and possesses unique, recognizable characteristics. Strains may come from particular river systems or individual farms or hatcheries. Strains are evaluated on the basis of weight gain potential, feed conversion efficiency, dress-out percentage, vulnerability to seining and disease resistance. Most of the strains currently used by catfish farmers have not been evaluated. Although preliminary results may be promising, until more research is conducted and more fingerlings are available, purchasing some “improved” strains may not be economically justified.

### **Health**

Fingerlings should be free of parasites and diseases. A sample from each pond that will be harvested should be submitted to a disease diagnostic facility. The diagnostician should check for viruses, active bacterial outbreaks and numbers of parasites. In Louisiana, samples can be submitted to the Louisiana Aquatic Diagnostic Laboratory at the LSU Vet School. Contact the lab at (225) 578-9672.

Some suppliers offer fingerlings that have been vaccinated against Enteric Septicemia of Catfish (ESC) for an additional cost. To date, the results obtained with these fingerlings in research trials and commercial grow-out have been mixed. If you have not had any experience with vaccinated fish, you may want to evaluate a small number of vaccinated fish against some non-vaccinated fish on your own farm.

Avoid treating fingerlings for parasites while in hauling tanks unless recommended by a fish diagnostician. Hauling tank treatments are often stressful and may lead to secondary disease problems. It is very common to lose a few fish each day for two to three weeks following transport.

Catfish fingerlings less than 3 inches long are susceptible to channel catfish viral disease (CCV) when water temperatures are above 70° F. To minimize problems with CCV (and many

other opportunistic pathogens), fingerlings should be handled during the coolest time of the day and should be moved in a cushion of water if possible.

Diseases must be avoided whenever possible. Do not become complacent based on a fingerling supplier's guarantee to replace any fish lost during the first several weeks after stocking. Once a disease organism has been transferred into your pond, the damage may far exceed the cost of replacing the lost fingerlings that originally harbored the problem.

### **Reliability**

Whenever possible, ask other growers where they buy fingerlings. Seek information on those fingerling producers who routinely sell the quantity of fingerlings that you will be purchasing. A fingerling producer who sells to farm pond owners should have more experience delivering small batches over longer distances. Producers capable of delivering large numbers of fingerlings should have the proper harvesting and transport equipment.

Visit the fingerling producer's farm early in the negotiations. Do not wait until the fingerlings are in the harvesting seine to decide that they are unacceptable. Try to visit while the producer is harvesting to see how the fish are handled. Find out which ponds the producer will harvest to obtain your fish. Take samples for diagnosis at this time if you will be purchasing fish within a week.

### **Transporting Fingerlings**

Channel catfish fingerlings are very sensitive to water quality changes that occur during handling and transportation. Every effort should be made to minimize stress and to maintain good water quality. Well water or spring water should be free of iron and ammonia and should be aerated vigorously before adding fish. The quality of pond water can deteriorate quickly in a hauling tank due to its natural fertility and organic components. Avoid pond water unless it is cool and clear and the fish are being shuttled only from pond to pond.

Be sure transport water has adequate aeration during both the loading and hauling procedures. Dissolved oxygen concentrations in hauling tanks should never fall below 5 ppm. Since fish with full digestive tracts consume more oxygen and often regurgitate feed during transport, it is recommended that fingerlings be starved for at least 24 hours before harvest.

Total hardness and alkalinity of hauling water should both be above 100 ppm, and the pH should be between 7 and 8. Salt is often added to hauling tanks at a concentration of 0.1% to 0.3% to reduce stress. Ice is sometimes added to hauling tanks to decrease water temperatures to about 65° F. This will reduce catfish metabolism and is recommended only for long trips at high water temperatures.

Recommended loading rates for channel catfish fingerlings vary, based on specific hauling conditions and the experience of the hauler. Typically, a safe loading rate for 6- to 8-inch fingerlings would be 4 to 5 pounds per gallon of water at 65° F. Table 3 provides some basic loading rate guidelines for various transport times. Loading rates should be adjusted when fish are transported at temperatures above 65° F or for longer times.

Before unloading fingerlings into their new environment, make sure the water in the hauling tank and the pond have a similar temperature, pH and hardness. Temperatures should not differ

by more than 5° F and pH should not differ by more than 2 pH units. A submersible pump can be used to acclimate fish by pumping pond water into the hauling tank to displace the hauling water gradually. Aeration should be continued until acclimation is complete. Unloading fingerlings with a chute hung on the door of the hauling tank works well to minimize stress. Avoid using baskets to transfer large numbers of fingerlings from the truck to the pond.

Table 3. Estimated pounds of channel catfish that can be hauled safely per gallon of 65 degree temperature water for various transport times.

Pounds Per 1,000 fish	Number Per Pound	8 Hours	12 Hours	16 Hours
0.1	10,000	0.20	0.20	0.20
1.0	1,000	1.25	1.00	0.70
2.0	500	1.75	1.65	1.25
4.0	250	2.20	1.75	1.50
8.0	125	2.95	2.20	1.80
20	50	3.45	2.50	2.05
250	4	5.00	4.10	2.95
500	2	5.90	4.80	3.45
1,000	1	6.30	5.55	

Refer to the Southern Regional Aquaculture Center series on transporting warmwater fish for more information:

<http://agpublications.tamu.edu/pubs/efish/390fs.pdf> “Equipment and Guidelines”

<http://agpublications.tamu.edu/pubs/efish/392fs.pdf> “Procedures and Loading Rates”

<http://agpublications.tamu.edu/pubs/efish/393fs.pdf> “Loading Rates and Tips by Species”