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Grayling Hatchery

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RESTRICTED FEEDING OF BROWN TROUT DURING WINTER MONTHS AT THE STATE FISH HATCHERY, GRAYLING, MICHIGAN

By

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The need for frequent feeding of trout at Michigan hatcheries during low water temperatures has been questioned, because the metabolism of fish is correspondingly slow at that time. According to C. M. McCay (The Progressive Fish-Culturist, No. 1, December, 1934, page 5), trout can be fasted for varying periods of time, and after a period of good feeding will exhibit growth equal to that of a similar group of fish in which the diet has not been restricted. Since water temperatures at some Michigan hatcheries range between 32° F. and 36° F. for several months, it was considered a possibility that more time and money than necessary were being expended in feeding trout during periods of low water temperatures. Tests were made at several hatcheries during the winter of 1951-52 and will be reported elsewhere. The Grayling station was selected for one series of tests because of the extreme and prolonged winter conditions. Here, the raceways freeze over and feeding must be accomplished for weeks at a time through holes cut in the ice. Normal practice has been to feed three times each week and since six to nine holes must be made in the ice-cover of each pond at each feeding, fewer feedings would save considerable time and money during this period.

Three ponds of yearling brown trout were set aside for the experiment, with the following instructions to hatchery personnel:

Pond 13. Feed three times a week at water temperatures of 36° F. and over, according to percentage of body weight and temperature as outlined in the New York State Fish Hatchery feeding chart. During water temperatures below 36° F. feed only once each week, always on the same day if possible. When feeding once a week, use the same weight of food as used in one feeding at 36° F.

Pond 14. Feed the same amount of food, and at the same frequency of feeding, as normally used at the Grayling hatchery. The food used should be accurately weighed and recorded.

Pond 15. Feed as in Pond 13, except that no feedings will be made when water temperature falls below 36° F.

The experiment began on December 24, 1951, and was terminated on June 1, 1952. Due to severe winter conditions and lack of help in the spring, the fish were weighed and counted only at the beginning and at the end of the test, rather than at the end of each month. The amount of food fed per month is given in Table 1, and results of the experiment are given in Table 2.

When the fish were counted and weighed on June 1, 1952, Mr. A. Moore, foreman, noted that the fish which were the most uniform in size came from Pond 14, and that the group with the greatest variation in size came from Pond 15. The unobserved loss was high among both groups on restricted feeding.

The fish that had the greatest gain, lowest mortality and lowest conversion were the fish in Pond 14 which were fed the usual frequency and amount of food according to past practices at the Grayling station. The fish that were not fed at all when water temperatures were below 36° F.

Table 1

Date 1952	Average temperature, degrees F.	Pond 13		Pond 14		Pond 15	
		Food fed, pounds--ounces	Known* loss of fish	Food fed, pounds	Known* loss of fish	Food fed, pounds--ounces	Known* loss of fish
December 24-31	33.7	35 --- 8	3	100	4	None	6
January 1-31	34.9	104 ---10	10	325	0	46 --- 5	6
February 1-29	35.8	148 ---12	3	300	1	86 --- 3	3
March 1-31	36.8	250 --- 4	0	325	2	165 --- 5	1
April 1-30	44.6	477 --....	1	353	17	388 --- 10	3
May 1-31	51.7	317 --- 7	40	357	5	284 --- 11	12
Totals	...	1,333 --- 9	57	1,760	29	971 --- 2	31
Actual loss**	...	... ...	472	...	239	... ...	620
Unobserved loss**	...	... ...	415	...	210	... ...	589

* Dead fish observed during course of feeding experiment

** Determined when ponds were drained at end of experiment

Table 2

	Pond 13	Pond 14	Pond 15
Number fish, December 24, 1951	4,229	4,295	4,233
Number fish, June 1, 1952	3,757	4,056	3,613
Percentage mortality	11.16	0.556	1.465
Pounds per 1,000 fish, December 24, 1951	136.0	110.0	109.6
Total pounds of fish, December 24, 1951	575.0	472.0	464.0
Pounds per 1,000 fish, June 1, 1952	185.5	189.8	161.3
Total pounds of fish, June 1, 1952	697.0	770.0	583.0
Gain in weight per 1,000 fish	49.5	79.8	51.7
Total gain in weight	122.0	298.0	119.0
Pounds of food fed	1,333.5	1,760.0	971.12
Conversion	10.93	5.906	8.16

(Pond 15) gained more weight per 1,000 fish than the fish (Pond 13) that were fed at least once each week, regardless of temperature. During the higher water temperatures, had the fish in Pond 14 been fed amounts comparable to that fed Pond 15, instead of according to the Grayling hatchery schedule, gain in weight per 1,000 fish might have been closer to that of the fish in Pond 15. This was not done because it was desirable to keep one pond of fish on the normal hatchery schedule for purposes of comparison.

The present tests at Grayling do not support C. M. McCay's findings in regard to diet restriction and subsequent recovery of condition. However, it would be desirable to conduct further tests during the winter of 1952-53 to determine whether some modification of current feeding practices might prove advantageous.

The interest and cooperation of Mr. B. Engel, Mr. A. Moore, and the hatchery crew, who actually carried out the tests, are gratefully acknowledged.

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