

The difference between the practical value and the price is therefore very small, and the expense can be still further reduced if a portion of the ground meat is replaced by cockchafers and a portion of the oats by cheap flour.

217.—ON MANUFACTURED FOOD FOR TROUT AND CARP.*

By CARL NICKLAS.

There has lately been published an article by Prof. C. O. Harz, giving the results of his microscopic examination of my food for trout and carp manufactured by Louis Goos, of Heidelberg. These results astonished me, for Dr. Harz has found in this food, with the exception of ground meat, all sorts of ingredients except those of which it is composed. The following sentence is characteristic of the entire examination: "I was not able to arrive at any definite results as to the presence or absence of linseed."

In order to be absolutely certain that Goos had manufactured the food in strict accordance with my receipt, I informed him of Dr. Harz's examination, requesting him to have the food, which had already been chemically examined at Marburg, also analyzed microscopically. I give below the result of this analysis:

MARBURG, *May 9, 1884.*

Mr. LOUIS GOOS, *Heidelberg:*

The specimen of fish-food transmitted November 3, 1883, by the Association for Furthering Fish-culture in the district of Kassel (Mr. Georg Seelig, in Kassel), when examined March 25, 1884, was found to contain—

| | Per cent. |
|--------------------------|-----------|
| Water | 13.34 |
| Proteine substances..... | 46.75 |
| Fat | 10.50 |
| Hydrate of carbon..... | 16.87 |
| Wood-fiber | 1.60 |
| Mineral substances..... | 10.83 |

This fish-food, according to the microscopical examination, is mainly a mixture of ground meat (meat-flour), an article of food which at present is used very extensively in agriculture, and flour prepared from the fruits of leguminous plants (probably vetches); its ingredients are, therefore, highly nutritive. Wheat and oats occur in small quantities, and indeterminate substances in exceedingly insignificant quantities.

PROF. DR. DIETRICH,

Director of the Experimental Agricultural Station.

* "Ein Fischfutter für Forellen und Karpfen." From the *Deutsche Fischerei-Zeitung*, vol. vii, No. 23; Stettin, June 3, 1884. Translated from the German by HERMAN JACOBSON.

I can accept this as a correct result, because it does not expect more from the microscope than that instrument can accomplish, and leave it to my readers to compare it with the result obtained by Dr. Harz. It is evident that insignificant quantities of indeterminate substances cannot be avoided, and every farmer knows that even if he cleans his grain ever so carefully some particles will slip in which do not belong to it.

Dr. Harz's article, however, causes me to make the following statement: To avoid mistakes I must state that the "food-flour" which Dr. Harz examined is no fish-food—would, in fact, be very expensive if used as such—but a dog-food manufactured by Goos for many years. I therefore need not consider it at all in this connection.

I was greatly surprised by Dr. Harz's statement that the food, after having stood in a room for twenty-four hours, developed a peculiar, disagreeable odor. From my own experience I must term this as pure imagination, for I kept this food for at least six months in my study, partly in small pieces and partly in open cigar-boxes, and I could never discover even the slightest odor. Since I moved into my present quarters—in October, 1883—I keep this food in my garret, and although it has become damp during winter, I cannot discover any odor whatever. I also keep a small quantity in my room, for feeding the fish in my aquarium, and cannot notice any odor. It is possible that the food examined by Dr. Harz had for some time been kept in a damp cellar and become infested with roaches and other vermin, which would to some degree explain the result of his examination and the odor.

Owing to the nature of the ingredients which Dr. Harz thinks he has discovered in the food, he has come to find it expensive, for which, however, I cannot blame him very much, since in my article "on the artificial feeding of carp"* I made use of the expression, "I have not taken into account the cost of producing the food, thus placing it at a much lower price." I have corrected this mistake in my article on the same subject in the *Bayerische Fischerei-Zeitung*, 1883, No. 1, 19-23, and I would recommend Dr. Harz to study this article. He has, moreover, not taken the salt into account. On the other hand Dr. Harz's erroneous calculation may be excused by the circumstance that he has based it on the cheap ingredients of the food, as erroneously found by him, while it consists of comparatively expensive materials. If Dr. Harz will take into account the cost of production and the salt, and consider that the manufacturer wants not only to make the interest on the capital invested in buildings, machinery, implements, &c., but also some net profit, he will hardly find Mr. Goos's price too high.

A person who manufactures the food himself will of course obtain it cheaper than if he buys it; but whether the gain will pay for the labor is a question which will be answered differently according to circum-

* F. C. Report 1882, p. 1009.

stances. For a person who needs but little of this food it may be advantageous to manufacture it himself; if he does this, he is not bound to follow the receipt for my food as manufactured by Goos, but he will find in my article referred to above several receipts, and may make different combinations based on my standard. There will be less doubt of fish taking kindly to this food than to that made according to Dr. Harz's receipt. But persons who have to use the food in their ponds by the hundred-weight—and in preparing my food I principally looked to feeding on a large scale, for which purpose the food should be made so as to keep for a long time—will, I think, do decidedly better to buy the food than to manufacture it themselves. It involves a considerable outlay for machinery, implements, and labor. Leaving out of the question the matter of expense, it will prove more advantageous to buy the food, because the fish will then always get the same kind of food, which is of some importance. A change of food is invariably followed by a temporary decrease in the weight of the fish.

I shall not follow Dr. Harz in his theoretical digression on the practical value of my food, as this would lead me too far; and I will only state in this connection what I said as early as 1879, in my work, "Agricultural double book-keeping and its relation to the income of farms," on page 30, on the practical value, which is of a relative character and cannot, as E. Wein does, be expressed in absolute figures, such as those employed by Dr. Harz in his calculations.

Briefly stated, the "practical value" of an article of food (or in fact of anything) is represented by the net gain over its price, obtained by using it, when it may be said to meet the requirements and circumstances of the buyer; while the "value of an article when bought" (*ankaufs wert*) is a price which yields a net gain above the mere price paid for it. This applies to my fish-food, as I believe I demonstrated in the article referred to, by figures, even if only approximately. Proof of this is furnished in Harz's article where he says "that the food has found great favor, and enjoys an excellent reputation among practical men." Dr. Harz finally thinks that he is rendering a great service to fish-culturists by recommending to them for fish-food a mixture of sesame, linseed-cake, and oats. As regards the qualitative chemical combination Dr. Harz has followed my standard of fish-food, and nothing can be said against him in this respect; but I have serious doubts whether trout will eat sesame and linseed-cake, or oats. At least I have never heard that they eat anything of the kind. It may be possible that carp will eat such food. It is therefore doubtful whether fish-culturists when having my food and other kinds of food which have stood a practical test will venture to experiment with it.

MUNICH, BAVARIA, May 20, 1884.