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Table of Contents.

First steps in Farming.—Young Man's Department.—Manure Constituents in food.

I am quite prepared to see you hold up your hands in incredulous astonishment, my friends, when you read this present article. In fact, nothing but ocular evidence could have persuaded me, I who am speaking to you, that, in certain cases 95 0/0 of the most valuable constituents of the food must be sought for, not in the flesh, fat, bones, etc., of the feeding animal, but in its manure.

We saw (v. Journal for April 1883, p. 179) that, for the same weight of dry food, the sheep produces nearly twice as much manure as the pig, while the ox produces even more manure than the sheep. You will observe that the food given to the pig, consisting as it usually does, in practice as well as in Lawes' experiments, of meal of different sorts, is much more digestible than the food given to oxen and sheep, a large part of which is made up of hay; and you will also observe that the quantity of dry manure (litter excluded) produced a week per hundred pounds of live weight, was nearly the same whether the animal eating the provender was ox, sheep, or pig: the greater consumption of food by the pig accounts for this.

We have also seen, when speaking of the valuable constituents of manure, that the nitrogenous matters and the ash are the only parts worth preserving—the bulky parts, the straw etc., are useful as mechanical distributers, as attractors and retainers of heat from the sun-rays. If the live weight of an animal remains unchanged, and there is no production of weight, all the ash and the nitrogen contained in the food will be voided in the dung; and, of course, the reverse is equally true: if the bodily weight is increasing, or milk is being produced, the amount of ash constituents and nitrogen in the manure will be less than that contained in the food in direct proportion to the quantity of those substances which has been converted into animal produce.

Some of the albumenoids (nitrogenous) and ash constituents are left undigested during the passage of the food through the alimentary canal; these are voided in the solid dung. The digested part of these constituents passing of course into the blood, becomes animal increase if the animal is giving milk or increasing in weight; and what remains is separated from the blood by the kidneys, and is discharged in the urine.

We saw, when considering what became of the food eaten by the three varieties of animals concerned in the Rothamsted experiments, that of every hundred of albumenoids (in barley meal consumed by a pig) twenty-one will be voided in the solid dung, and seventy-nine pass into the blood. Now, if a pig consume five hundred pounds of barley-meal, containing about fifty-three pounds of albumenoids, it will increase in weight about 100 lbs. which animal increase will be found to contain about 7.8 pounds of albumenoids. Whence it follows that for every hundred pounds of albumenoids consumed, 14.7 are stored up as carcase, 21 appear in the solid dung, and 64.3 as urea, etc., in the urine. In the same way, deducting the ash constituents stored up in the animal from those originally present in the food, we get at the quantity present in the manure. And to make this the clearer by a concrete statement—for these abstract calculations are always troublesome to my mind, which is not half as well trained as it ought to be—you may study the following table:

NITROGEN STORED UP AND VOIDED FOR 100 CONSUMED.

	Stored up as increase.	Voided as solid dung	Voided in urine.	In total manure.
Oxen	3 9	22 6	73 5	96 1
Sheep	4 3	16 7	79 0	95 7
Pigs	14 7	21 0	64 3	85 3

ASH CONSTITUENTS STORED UP AND VOIDED FOR 100 CONSUMED.

	Stored up as increase.	In total manure.
Oxen	2 3	96 7
Sheep	3 8	96 2
Pigs	4 5	85 5

How very small is the amount of nitrogen and ash stored up in the fattening animal! It seems, at first sight almost incredible. More than 95 0/0 of the ash, in each of the three cases, finds its way into the dung, and with oxen and sheep, more than 95 0/0 of the nitrogen too! The pig converts a larger amount into carcase, but no great things after all.

Again, look at the urine. From three to four times as much nitrogen in it as in the solid dung! This proportion depends entirely on the food, however. in the case of an animal fed on hay, the nitrogen will be found to be a little in excess in the solid dung; on straw, the excess will be still greater; but if cake, corn, and roots be given, the urine will contain a large excess of nitrogen over the solid excreta. From this, as cake, in fact feeding stuffs of a high class in general, contain large quantities of nitrogen, we may conclude that if the