

Agricultural.

AND DOMESTIC.

RICH LEAN JUICY MEAT—ITS PRODUCTION AND ADVANTAGES.

(By an English Farmer.)

As practical farmers we have yet to learn how to carry out advantageously, in the daily pursuit of our profession, under the artificial systems of husbandry now practised, the natural system of fattening cattle, so as to be able at pleasure to increase the proportional quantity and quality of the lean part of our beef, mutton, and pork—the proportion that fetches the most money in the market. We can increase the proportion of fat to almost a fabulous amount; but that which procured for the 'Roast beef of Old England,' with its rich 'brown gravy,' a world-wide fame, in the days of our forefathers, we cannot produce. For such we must go to the wilds of Lochaber, Connemara, or Wales! There Nature can grow juicy lean meat, with its fine brown gravy. True enough, we read many very nice plausible theories in the columns of agricultural journals relative to flesh forming substances; but when we enter the feeding stall at the homestead, and begin to examine tangibly our cattle preparing for the shambles, the beautiful theories thus taught us with so much analytical erudition are, unfortunately, no where to be found. For want of certain articulating membranes, or some contrivance to bind them together, the bubbles on the surface of the fair-flowing stream immediately burst, their elementary contents vanishing instanter into thin air. Disappointment is the common lot of fallen humanity; and, if we mistake not, the oracles of more than one obese experimental school are about to join those of the Delphic of old, the public palate having lost its relish for oily fat. But be this as it may, practical farmers have one consolation in plenty of customers for rich, juicy, lean meat, with the corresponding encouragement to grow it. Such being the position of the practical man, let us briefly examine from an economical point of view his professional duties in the manufacture of rich juicy chops and steaks for the miller.

In the first place we have to turn our reader's attention to the fact that it requires a much less consumption of food (provided such food is of a proper quality) to make flesh on the lean portion of the meat, than it does to make the rough fat of the obese system that goes to the tallow chandler. This arises from the large per-centage of water which the former contains, especially when compared with the peculiar composition of the latter. Thus according to the analyses of Brande and others, the lean of rich mutton may contain about 70 to 73 per cent. of water, and the lean of rich beef 74 to 75, so that 100 lbs. of the lean of rich mutton is composed of 70 lbs. to 73 lbs. of water, and from 27 to 30 lbs. of the solid materials of flesh; while the lean of rich beef contains 74 lbs. to 78 lbs. of water, and from 22 lbs. to 26 lbs. of solid matter. Now from these data it consequently follows, that if we can add 100 lbs. of rich lean mutton to the carcass weight of our fattening sheep, we only require from 27 lbs. to 30 lbs. of the solid flesh-forming matter to do so, or rather perhaps we should say, only 30 lbs. of the dry solid food is used up in the manufacture of 100 lbs. of rich, juicy lean mutton; and 26 lbs. in the production of a like increase of a rich, juicy, lean beef. On the other hand, fat contains but a small per-centage of water, so that nearly the whole weight of the superfluous amount of fat now produced under the obese system of fattening is from the solid part of the food. Such is the contrast; and when we come to strike a pecuniary balance between the two systems, the difference in favour of the production of rich lean meat on the natural system will be found to exceed what some may at first sight imagine.

The above data, we have in the next place to observe, has chiefly reference to the flesh of young growing animals; the proportion of elementary substances, or of the proximate principles of the flesh, remaining nearly the same when the animal is slaughtered, as when it was put up to fatten for the shambles. In practice, however, such data are often exceptional; for after the ox or the sheep has attained maturity of growth, the weight of bone, muscular tissue, and other parts remain nearly stationary; so that when a full grown, but lean animal, is put up to fatten, the increase that takes place in the weight of the lean meat added during the process of fattening contains a larger proportion of water. In the case of fattening sheep previously quoted, some thirty per cent. of solid matter of the food was used up in the formation of the albumen, fibrine, gelatine, ozmazome, and the other solid substances composing the flesh. But in the case of the

full grown sheep, the solid materials of the food used up, in forming the increase in the weight of the flesh, do not amount to so much—say, for the sake of illustration, from ten per cent. of this increase is water, including the blood, lymph, and juice of the flesh. In the case of the full grown lean ox, a corresponding difference is experienced in favour of the consumption and conversion of water, along with condiment, into rich juice, for the shambles. In other words, increase of weight is comprised of the rich juice of the flesh—beef or mutton, as the case may be—with the corresponding increase that takes place in the blood and lymph, to preserve the normal equilibrium of the fluids.

The practical question, when comparatively viewed, lies between the manufacture of the rich juice of lean meat, and the manufacture of the tubfuls of superfluous rough fat, unfit for human food, that go from the butchers to the tallow-chandler, with the advantages and disadvantages experienced under the two practices or systems now in operation of fattening cattle. In other words, we have in the above an illustration of the old question of 'black gravy versus white gravy,' which engrossed so much of the attention of the agricultural mind towards the close of the last century, and during the early part of the present. Our fathers and grandfathers, for example, knew the difference between the two systems of fattening in question, viz., the natural system, handed down to them by previous generations, and the obese system of fattening on oilcake, and other feeding materials of an abnormal character, that began to be practised and generally adopted in their own times. At that period, a very erroneous notion prevailed relative to the dietetic value of the fat of beef and mutton, for it was considered the most nutritive and valuable portion of the meat; indeed, this fallacious opinion was common fifty years ago. Thus says a writer of the period (Lawrence): 'In regard to the flesh of animals, and its proper state for human food, I apprehend we have long been in error, and the current of fashion still runs strong for its continuance. It is the presumption that fat is the most valuable part of the carcass, and that a propensity to the laying on of fat, is the most, or rather the only valuable property in cattle.' Thus supported, the obese system ('white gravy') 'carried the bell' against its older rival (black gravy); but now that public opinion is changed as to the dietetic value of fat, and that rich lean meat fetches twice the price of rough fat in the market, and requires less feeding material to produce it, the old natural system of fattening is again coming into favor, because under it we can produce not only an increase in the flesh or lean portion of our beef and mutton for the shambles, but also at the same time a sufficiency of finely flavored fat, mixed or engrained with the lean: whereas the obese system is diametrically opposed to the growth of flesh, or of an increase in the weight of lean meat, its tendency being calculated to produce atrophy of muscle, with a predominance of coarse, patchy fat, the consumption of feeding materials required to produce a given amount of carcass weight being often more than twice that under the other or natural system, a difference of result which is easily explained on chemical grounds.

The difference between the natural system of fattening cattle and the obese system is thus so great, as hardly to leave any chance to the modern farmer but to adopt the former, the practice of his ancestors, under such improvements as the more scientific rationale of the current age may suggest. No doubt the latter is not without its advantages also, in the form of the rich manure it makes for the land. This is certainly no little consolation to its advocates, and we should regret to under-estimate its value one iota. But rich as the droppings of oilcake obese-fed animals may be, yet, when placed in the scales with the rich, juicy meat of the natural system, they are found greatly wanting in yielding ready-money profits to the farmer. On the contrary, nothing could illustrate more forcibly the penny-wise and pound-foolish economy of the whole obese system, than the inestimable value its supporters put upon its rich manure—its valuable flesh-forming elements being converted not into flesh (?), but into dung, to fertilise the land, in order to grow feeding material to produce enough fat for the use of the tallow chandler!

We have next to examine the feeding materials that supply the aliment which has been assimilated or used up in the process of increasing the carcass weight of the animal when fattened on the natural system, in order to ascertain what they are, and how to supply them in the food. In other words we have to solve the problem as to what the

substances are that form the rich lean and fat of our fine beef or mutton, the rich juice forming and fat-forming substances under the natural system of feeding cattle.

The protein elements of flesh, as they have been called, including fibrine, albumen, and gelatine, that are used up in the above process of increasing the carcass weight of the rich, juicy, lean meat in question, form but a very small per centage of the whole proximate principles thus utilized from the food. It is therefore highly unscientific and illogical to designate the former (the protein elements) the flesh-forming materials of our cattle. As it is only the natural practice of fattening, and its general principles, that we are discussing, it will be unnecessary to quote the detailed analysis of rich, juicy flesh, in order to show the actual per-centage of protein matter in juxtaposition with the others. Indeed we have no trust-worthy analyses to quote. It has already been shown that in meat of an ordinary description about three-fourths of the whole is water, and when we add to this that only about the half to two-thirds of the solid materials of the flesh is protein, the reader will perceive that they (fibrine, albumen, and gelatine) only form about one-eighth to one-fifth of the whole weight; and we may observe, the greater the quantity the worse the argument. Indeed it would be much more correct to designate the osmazomic, kreatine and kreatinine, the lactic acid, phosphoric acid, inosinic acid, the lactate and phosphate of potash, the chloride of potassium, and other salts, the flesh-forming materials, as the formation of flesh is entirely dependent upon, or mainly due to, their presence. Thus (quoting the authority of Pereira and Majendie,) 'muscular flesh, in which gelatine, albumen, and fibrine are combined, according to the laws of organic Nature, and where they are associated with other matters, such as fats, salts, &c., suffices, even in a very small quantity, for complete and prolonged nutrition.' 'Dogs fed solely for 120 days on raw meat from sheep's heads, preserved their health and weight during this period, the daily consumption never exceeding 300 grammes (= 4,630½ grains troy), and often being less than this quantity. But 1,000 grammes (= 15,434 grains troy) of isolated fibrine, with the addition of some hundreds of grammes of gelatine and albumen, were insufficient to support life.' 'What then,' exclaims Majendie, 'is the peculiar principle which renders meat so perfect an aliment? Is it the odorous and sapid matter that has this function, as seems probable? Do the salts, the trace of iron, the fatty matters, and the lactic acid contribute to the nutritive effect, notwithstanding they constitute so minute a portion of meat?' (Pereira's Treatise on Food and Diet.) The opinion of this able chemist is thus plainly stated, that the peculiar function of the odorous and sapid properties of the meat is that which renders the whole alimentary. They (the odorous and sapid properties) are the flesh-forming materials, and this conclusion he deduces from the experiments made at the instance of the French Government, under the 'Gelatine Commission.' When dogs were fed exclusively on mutton, lard, and fatty matters, large quantities of fat were secreted, so that the animals increased the quantity of fat in their bodies, but rapidly experienced atrophy of muscle, &c., so that they soon died. The dogs, in the above experiment, that were fed on isolated fibrine, albumen, and gelatine, lost both their lean and fat before they ceased to exist, thus leaving the practical conclusion manifest to the high alimentary and flesh-forming value of the condimental properties of food; while it is equally conclusive that the protein elements alone are not flesh-forming.

As it is with carnivorous animals so it is with herbivorous animals. If the flesh-forming elements of the food of the former are the odorous and sapid properties of the animal food they consume, so the flesh-forming elements of the food of the latter are the odorous and sapid properties of the vegetable food they consume. If we wish to produce heavy weights of coarse fat meat, comparatively unfit for human food, we have only to turn our sheep and neat cattle into the coarse, washy, insipid herbage of a water-meadow in summer, or to put them upon cake, hay, and turnips in winter, to obtain the solution of our problem; but if we, on the other hand, wish heavy weights of rich, juicy meat, with a sufficiency of finely flavored fat, so as to render the whole carcass in the highest degree nourishing and economical, we must then give our fattening cattle food rich in those odorous and sapid properties of which such meat is formed. And more than this; for we must not only give feeding materials supplying those odorous and sapid properties natural to the chemical senses (smell and taste) of our cattle, according to their respective requirements, but

such feeding materials must be free from noxious matter, or even an excess of albuminous or oleaginous principles. In short, the food for our cattle should be not only normal in quality, but also in quantity; for it is now an authenticated fact that the normal flow of the gastric and other secretions of the alimentary canal will only digest the normal quantity of food required; consequently, that when animals are induced to eat larger quantities than natural, as under the obese system of feeding, gastro digestion is imperfect, and so are all other processes, digestive, alimentary, and excretory, in the animal economy. All the organs require a regular supply of their natural stimuli, including heat, light, &c., in order to enable them to perform their respective functions, and this is what they should have with the greatest impartiality to every function.

In the olden time, when in-door winter fattening was the exception, and out-door summer fattening the rule, certain grounds were set apart for preparing cattle for the shambles, because experience had taught our ancestors that the herbage of such grounds was better adapted for fattening than the herbage of other grounds; and to this day such grounds are well known to practical men. They are not confined to our low-lying rich grazing meadows, but are to be found rather on elevated pastures, amongst the highland glens, south downs, and on some very rich corn-bearing lands, when subject to the plough. Now it is a well-known fact that those grounds that produce the greatest quantity of the finest quality of beef and mutton are not those that produce the largest quantity of grass per acre. The natural and practical rule, on the contrary, is that the finer the quality of the herbage, and the richer it is of the odorous and sapid qualities required by the fattening animals, the less the quantity they consume to produce a given amount of carcass weight.

All who have paid attention to the practical data at issue, must therefore be satisfied with the soundness of the general principles advocated. No doubt the olden time was not without its examples of the twofold kind of obese fattening, of which sheep-rotting meadows, irrigated pastures, and all rapidly-grown etiolated herbage may be quoted as illustrations; but in all such cases the quantity of herbage consumed was, as it now is, immensely large, while the quality of the beef and mutton produced was and is coarse in the extreme, being devoid of the requisite supply of those odorous and sapid properties upon which their natural value depends. Thus, when the meat was deprived of its natural condiment, Majendie's dogs consumed four times the quantity which those did that were otherwise fed; so that the objection thus raised against the principles advocated turn out to be important practical data in their favour the moment they are examined and seen in their true practical light.

Individually considered, the odorous and sapid properties or condimental principles, required by cattle in their daily food must, from the peculiar function they appear to serve in the animal economy, be estimated at a very high figure—a fact which of itself ought to encourage the investigation of the subject, as to what those condimental substances chemically and medically are, which different kinds of animals and qualities of feeding material required. That they are of a very diversified character, and that animals require changes when fed under artificial systems as they do when fed under the natural system, or when they are allowed to select for themselves, appears reasonable to conclude. When nature furnishes so many practical lessons in every province of the kingdom, is it not the bounden duty of farmers to profit by her successful example?—W. B. Farmer's Magazine.

THE LOVE OF KNOWLEDGE.—When I say, in conducting the understanding, love knowledge with a great love, with a vehement love with a love coeval with life, what do I say but love innocence, love virtue, love purity of conduct, love that which, if you are rich and powerful, will sanctify the blind fortune which has made you so, and make men call it justice? Love that which, if you are poor, will render your poverty respectable, and make the proudest feel it unjust to laugh at the meanness of your fortunes. Love that which will comfort and adorn you, and never quit you, which will open to you the kingdom of thought and all the boundless regions of conception, as an asylum against the cruelty, the injustice, and the pain, that may be your lot in this outward world, that which will make your motives habitually great and honourable, and light up in an instant a thousand noble disdain at the very thought of meanness and of fraud.—Sydney Smith