THE FARMER'S ADVOCATE.

There being now a boom in the United States in favor of food cooking, I have carefully weighed the arguments of the live-stock organs. The sum total of their philosophy is this : Heat bursts the starch granules and makes the food more digestible. This reasoning assumes (1) that the food is all starch, and (2) that it is de sirable to make it more digestible by artificial means-both of which assumptions are as absurd as they are ruinous to the interests of the parties whose cause the organs presume to espouse. Let us first examine the process of nutrition and the effects of heat on the different constituents of the food, then compare the results with the most accurate feeding experiments that have been conducted.

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Granting that "heat bursts the starch gran ules," the effect of heat on the other constituents still remains to be considered. Starch and its equivalents (sugar and cellulose) are the most worthless compounds in the food, and most foods contain them in too great abundance, so that unless it can be shown that the other constituents are not proportionably in jured by cooking, the theory falls to the ground The fats of the food are liquified by the heat of the body and become absorbed, so that the cooking of the fats would be a wild speculation. With regard to the albuminoids, the most valuable of the food constituents, it is well known that heat coagulates albumens and renders them less digestible. It does not require a high temperature to effect this condition. Starch, before it can become absorbed into the circulation, must be made soluble by being changed into sugar. This change is not effected by cooking, but requires first the action of the sa liva obtained in the process of mastication, a further solution of starch and cellulose (crude fibre) being effected in the intestines partly by the action of the pancreatic juice and partly by fermentive processes. It can readily be observed that the tendency of animals is to swallow cooked foods with little or no mastication, so that the practical effect of cooking is to shift the work from the jaws to the intestines, overburdening the latter, which is certainly a very undesirable object. Not only so, but mastication is required for the albuminoids of thefood. not on account of any chemical action of the saliva, as is the case with starch, but for effecting a fine mechanical division, thereby lightening the burdens of the stomach. The albuminoids are attacked by the gastric juice in the fourth stomach of ruminants, and converted into diffusible substances. It is quite probable that the albuminoids of cooked foods require more mastication than those in raw foods. These facts are well known to physiologists, but for more practical results it is considered desirable to carry out accurate feeding experiments, so that if any discrepancy arises, the causes may be investigated. The most accurate and extensive feeding experiments which I have yet seen reported were conducted at the Maine Agricultural College, pigs having been used for the purpose, and the test period covered nine consecutive years. The following statement gives the average results : In 1870 the value of cooked meal to raw meal was as 95.5 is to 100; in 1871, as 74.8 is to 100; in 1872, as 82 is to 100; in 1873, as 91.6 is to 100; in 1874, as 98.8 is to 100; in 1875, as 73.3 is to 100; in 1876, as 88.8 is to 100 in 1877, as

64.2 is to 100; in 1878, as 78.5 is to 100; average for 9 years as 83.3 is to 100. According to these figures the average loss

in the cooked food amounted to 17 percent, without taking the extra cost for labor, machinery, etc., into the calculation. I usually place considerable reliance in those

painstaking experimenters who have distinguished themselves in their profession, but there are conditions connected with the above tests which impair their practical usefulness. In the reports which came under my notice, no mention was made of the albuminoid ratio of the foods consumed. I can hardly believe that the experimenter omitted this important fea ture ; but it is quite possible that I only saw a synoptical form of the reports. From the physiological laws already laid down, how can it be possible that many feeding experiments have produced reverse results ? It is quite probable that a high albuminoid ratio-a ration that is over-rich in flesh-forming constituents-would, in some instances, be benefited by cooking, while a wide albuminoid ratio-a ratio containing an excess of starchy matter--would usually produce contrary effects. A great deal would also depend upon the relative vitality of the organs of digestion, which varies materially in individuals as well as breeds. In a high albuminoid ratio of cooked food, the value of the solid excrements would be largely increased, whereas a high ratio of raw food would increase the value of the liquid excrements. Apart from any speculative view, the farmer will now see (1) that the partial destruction of the most nutrient principles of the food for the purpose of enriching the solid excreta is not practical at present; (2) that the cooking of a high and expensive ratio for the purpose of balancing the ration is absurd ; (3) that the shifting of the burdens from the jaws to the more deli cate organs is an exhibition of insanity. Health and thrift can only be maintained when all the organs of the body are duly exercised in proportion to their strength.

Compare these observations with the deplorable condition of the human race. Dentists are expressing alarm at the rapidity with which the human teeth are becoming obsolete; and under the mad delusion that artificial machin-

In feeding stock the question is not, Should the food be ground ? but, How can it be prepared so as to secure the most efficient mastication? Show me the eating habits of the animal and then I will explain. If the food is to be gobbled down, let it go ground rather than whole. Don't keep animals that require ground food. When the digestive organs have strong vitality, less mastication is necessary. By cutting the coarser fodders and mixing them with the grains and by-products, much can be attained. It is not worth while drawing a distinction between ruminants and non-ruminants; look at the hog-it can digest almost anything. while the ox, with all his grinding facilities, may be said to require more "cud." I might also dilate upon the advantages of grinding and cooking food for old, toothless animals, but I purposely confine my observations to profitable undertakings, leaving other writers to expend their powers in other directions.

DEC., 1885

An Apology for the "General Purpose" Cow.

We have been abused for denouncing the 'general purpose" cow, but no facts or figures have ever been advanced to prove to us that beef and milk in the same animal are quite consistent. The whole issue depends upon the detinition of the word beef. Our fat stock shows have disseminated the impression that fat is beef, and it was chiefly for the purpose of expelling this popular delusion that we urged our arguments so forcibly. None but the Shorthorn breeders have taken offence, for it is not claimed that any of the other popular breeds possess "general purpose" characteristics. Now that the truth is becoming popular amongst the authorities, although not amongst the speculators, namely, that genuine meat consists of muscular tissue, not of tallow or lard, we are enabled to present a phase of the question which must be particularly pleasing to our Shorthorn breeders.

If, according to Prof. Arnold, milk is, in part at least, derived from decomposition of tissue (lean.meat), then the more muscular tissue, the more milk. There is nothing inconsistent in this, and every observing farmer must have noticed that cows which have their bones well covered with lean meat may be excellent milkers. The N.Y. Tribune pertinently puts the question in the following language : It is pretty evident that feeders and breeders are beginning to consider the demands of the consumer, that in first-class butchers' meat there shall be more lean and less fat, or, in other words, a maximum of tallow shall give place to a fair proportion of tender and juicy meat. The consumer who now buys a joint of first-rate ripe beef, mutton or pork, pays for three pounds of fat and bone to one pound of lean, and the fat being good for little else than soap grease, the portion available for eating costs him three prices. It is worth while, perhaps, to consider the changes which have taken place in the chara ter of butchers' meat within fifty years or so, and how fat has usurped the place of lean. Then, if, when a steak or joint was bought, the butcher ventured to remove a portion of the fat, the buyer protested, being desirous of getting as much fat a possible, not only because it was scarce, but more because the fat of those days, when cooked, could be eaten with relish. But now the consumer insists that the dealer shall give him as little fat as possible, because he has more of it than he knows what to do with, since, when cooked, it cannot be eaten. The difference between the quality of the fat



ery should supplant our jaws in the manufacture of digestible food, our digestive organs are also threatened with extinction. In our dietetic habits, we not only fail to take the kind of nutriment which builds up the toothy and other osseous structures, but a double loss is inflicted by our neglect in making our teeth fulfil the duties imposed upon them by nature.

Closely allied with this subject is the ques tion of grinding food for stock. Here again the object is, of course, to prevent calamity from befalling the jaw bones. If the jaws and their auxiliaries, the teeth, are incapable of performing their duties, the farmer can easily ascertain the fact ; but it seems to be necessary to allow the other digestive organs to become deranged in order to encourage veterinary science, or quackery, according to the necessities of the case. The work must be done, and if Mr. Jaw is too lazy to do it, he shifts the responsibility on Mr. Intestine. It seems to be an inflexible law of nature that the strong oppress the weak, both thereby becoming weaker, and the time may come when there will be nothing fit to survive.