

MEATS—THE PRESENT ASPECT OF SUPPLY, CONSERVATION AND DEVELOPMENT.

W. H. LIPMAN, M. D.,

Medical Director, Swift & Company, Chicago, Ill.

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Eight million food animals die each year from disease and exposure on ranches and farms. A million more are condemned in the abattoirs. This waste calls for preventive work, which is under way, and for conservation through utilizing better the coarser meats and the fats. Here is advice for wasteful Americans, who usually take only the best.

IT is not necessary to tell an American audience today that food helped win the war. Almost from the very first day of the conflict the allied countries depended very largely on the United States for their indispensable food, wheat, meat and fats, for their armies as well as for the civilian population. Without American food the allied armies could not have been kept in the field as long as they were and allied labor could not have produced the needed war material.

Now that the treaty has been signed and the world is beginning to learn the true state of affairs in the countries of the central powers, it is becoming evident that lack of food contributed largely to the collapse of the enemy.

From olden times to the present day meat in some form has been an important part of army rations. Officers state that our Filipino troops have become finer and stronger physically since they were put on full United States army meat rations, and the same is true of the civil population that changed from vegetarianism to meat-eating.

More than one half of the people of the world eat little meat. The English-speaking peoples are the greatest meat-eaters. Asiatics, with the exception of the Siberians, eat very little meat, although consumption of meat in Japan is

gradually increasing. The per capita meat consumption of a country has been referred to as a good index of its prosperity. Thus, Australia, the richest per capita country in the world, is also the greatest meat consumer. It has been estimated that 50,000,000 of the world's population eat the bulk of the meat produced and the per capita consumption has been estimated at 93.3 pounds dressed weight of beef, mutton and pork, including the fats and other products.

The per capita consumption of meat for the leading countries has been estimated by the United States Department of Agriculture from available sources as follows:

Australia	262 pounds
New Zealand	213 pounds
United States	171 pounds
Argentina	140 pounds
Canada	137 pounds
Cuba	124 pounds
United Kingdom	120 pounds
Germany	116 pounds
France	79 pounds
Denmark	76 pounds
Switzerland	75 pounds
Belgium	70 pounds
Netherlands	70 pounds
Greece	68 pounds
Austria Hungary	64 pounds
Norway	62 pounds
Sweden	62 pounds
Russian Poland	62 pounds
Russia (Poland out)	50 pounds
Spain	49 pounds

Italy	47 pounds
Portugal.....	44 pounds

All the meat-eating countries are also meat producers, but only few of them produce more than their consumption, namely, the United States, Argentina, Australia, Canada, Denmark (bacon only), Mexico (under normal conditions), New Zealand and Uruguay.

The surplus of these countries is exported to those countries that do not produce enough for their own use. The former are termed surplus countries, and the latter deficiency countries.

Just prior to the war the general condition of the world's meat production was about as follows: Cattle production was stationary, that is, they were not increasing in number, sheep were materially decreasing and swine were increasing. This can be more strikingly illustrated when the number of food animals is computed on the basis of per capita of population. It is found that prior to the war cattle and sheep had not kept pace with the population, although swine had gained slightly.

Then the great catastrophe of August, 1914, was forced upon the world, and it was but natural that the number of meat animals should still further decrease, not only in the belligerent countries but also in some of the contiguous countries. However these losses have been more than offset by gains in other countries, so that both cattle and swine show a gain in numbers during the war. Only sheep have decreased. There has been a marked increase in the slaughter of food animals in all the belligerent countries, not only to meet the demands of the armies, but also because of lack of food for the animals.

According to the Department of Agriculture of France, there has been a reduction of meat animals from December, 1913, to July, 1915, in the territory

unoccupied by the enemy amounting to 17 per cent in cattle, 16.8 per cent in sheep, 22.1 per cent in swine and 68 per cent in goats. The British Board of Agriculture estimates that during the year ending with June, 1915, there has been a slight decrease in the United Kingdom of cattle and swine.

All the belligerent European countries are meat deficiency countries, and when the war cut their supply they had to turn to the United States as their only hope to fill the ever-increasing needs for their armies and people at home.

The United States was for more than a quarter of a century the abattoir of the world and furnished the lion's share of the world's meat exports, but by 1914 it had ceased to be an exporter of fresh, chilled and frozen beef; in fact, it had begun to import fresh beef. It was still the greatest exporter of pork and pork products, furnishing three quarters of the total of the world's exports of those meats. Practically the total exports of mutton came from the Australasian colonies and Argentina.

Actuated by the stimulus of an increasing demand at enhanced prices, the American meat industry set itself to increase the supply of food animals, and when we entered the war in 1917 it became a duty and a privilege for the American stockman and the American packer to supply the needs of our government and of the Allies. The way they responded will ever remain one of the bright chapters in the history of the part the United States played in the war. A steady stream of cattle, sheep and hogs poured into the great packing centers and just as steadily did the flow of meat keep going across the Atlantic and into the great camps of this country, without hitch or interruption.

Exports of meat and meat products from this country have increased from

1,142,000,000 pounds in 1914 to 2,005,000,000 in 1917, almost 76 per cent.

When it is remembered that this task was accomplished with labor the scarcest in history and greatly reduced, unsettled transportation facilities, it becomes apparent that the American farmer, stockman and packer have rendered a great service to humanity.

Not only have meat exports increased but the actual number of cattle and hogs on the farms and ranches in this country have also increased. From January 1, 1915, to January 1, 1918, cattle have increased from 58,000,000 to 67,000,000, and hogs have increased from 65,000,000 to 71,000,000. Sheep have decreased from 50,000,000 to 49,000,000.

The price of meat has, of course, increased according to the law of supply and demand and the cost of feed, but not to as great an extent as other staples and war materials. While the price of live stock had increased 39.9 per cent from 1915 to 1917, the wholesale price of meat had only increased 20.7 per cent during the same period. This was made possible by the scientific and economic utilization of by-products by the great packing houses and the increase in value of these by-products.

Now that the war is over, all are speculating and prophesying as to what effect peace will have on the economic condition of the world. A great many divergent opinions have been expressed, but every one agrees on one thing, and that is, that for some time to come the United States will have to feed the greater part of Europe, particularly with pork and fats. The meat-hungry population, especially labor, will need meat in order that the great task of rebuilding the devastated countries can be accomplished, and what is equally important, meat and other foods are needed to stay the ravages of disease, especially tuberculosis, which,

according to reports, began to appear in some of the belligerent countries during the latter part of the war.

Examination of live stock conditions in other producing countries seems to indicate that the United States will be depended on to produce a large share of the meat of the world.

The ways and means necessary to maintain the supply of meats in the United States adequately to meet the reasonably expected demands, may be divided into three classes:

1. Measures to maintain and increase the production of food animals.
2. Prevention of loss of food animals and of meats.
3. Conservation of meats and meat products.

As stated before, cattle and hogs have materially increased in number since the beginning of the war. In addition, the hogs marketed in 1918 were of greater average weight, showing that they were fed longer before being sent to market.

Fortunately hogs can be produced more rapidly than any other food animal, two litters per year being possible for the average sow. The hog is easily the most economical animal to feed.

The hog is also the most important animal from a dietetic standpoint, especially in a crisis like this, because of its great yield of fats, and this is confirmed by the fact that half of the export of pork products in the early part of the war was made up of lard.

The necessity for increasing the number of sheep is due to their wool as well as meat.

A great deal has been done since our entry in the war to encourage the raising of food animals.

The work may be said to have begun when the Secretary of Agriculture, on April 4, 1917, called a conference of agricultural representatives and officials of

the states, presidents of land-grant colleges and others for the purpose of discussing the food emergency. The first conference held in St. Louis was followed by a second in Berkeley. The whole food situation was thoroughly discussed and a campaign outlined, the essential features of which were incorporated in the Food Production and Food Control Acts, passed by Congress August 10, 1917, followed by the creation of the office of Food Administrator. The Food Production Act carried an appropriation of more than \$11,000,000, a part of which was to be used for a campaign to increase live stock, prevent animal diseases and to urge the conservation of meat, the work to be under the control of the Department of Agriculture.

A strong educational campaign by means of literature, lectures and demonstrations was soon inaugurated in coöperation with state agricultural bodies, colleges, the agricultural press, live stock associations and other interested groups. Trained experts were sent to the various states to teach economical live stock production as well as raising of feedstuffs.

The peculiar adaptabilities of the various sections of the country for stock raising were studied and advantage taken of them. Stock were removed from sections where feed was scarce to where it was plentiful, and markets were provided.

The hygiene and sanitation of the farm and ranch are being taught the individual farmer and farmers' organizations.

Unquestionably all these undertakings and many others that have been carried on have been largely instrumental in bringing about the beneficial results accomplished.

Next in importance to live stock production is the prevention of losses of meats. Meats are lost in two ways: By the death of animals from disease and exposure on the farms and ranches and

by the condemnation of carcasses and parts by the inspectors of the Federal Department of Agriculture.

It has been estimated that from 8,000,000 to 10,000,000 good animals die annually on the farms and ranches from disease and exposure. According to the reports of the Chief of the Bureau of Animal Industry, under whose control meat inspection is conducted, condemnations for disease of whole carcasses and parts of carcasses on post-mortem examination for the four years ending with 1917 were as follows: above 1,000,000 carcasses, and nearly 3,000,000 parts of carcasses.

It can readily be seen that these enormous losses constitute a serious drain on the meat supply and call for energetic repression measures.

Of course, some food animals will always die of disease or become diseased sufficiently to be condemned, but when we study these diseases we find that among animals as well as among people the diseases that cause the greatest mortality are largely preventable, namely, tuberculosis, hog cholera, contagious abortion and Texas fever.

Tuberculosis and hog cholera were the cause of approximately 80 per cent of the total condemnations, the remaining 20 per cent being divided among forty other causes. The inference afforded by these figures clearly is that tuberculosis and hog cholera are the two important diseases producing the greatest loss of meats through condemnation. They also cause a great loss in cattle and hogs by death on farms and ranches. Tuberculosis also causes indirect losses in cattle by diminishing fecundity, curtailing the milk supply and disturbing nutrition, thereby bringing about a decrease in weight.

The Federal Department of Agriculture long ago recognized the necessity of eradicating these diseases and instituted

effective measures through the Bureau of Animal Industry with gratifying results, notably in the reduction of 30 per cent in hog cholera since 1914.

Since the war the scope of this work has been materially broadened. Congress expressed its recognition of the importance of anti-tuberculosis work by appropriating \$500,000 for the fiscal year (1918).

Great advances have been made in tick eradication and much territory previously closed to cattle raising may be released within a few years.

The primary function of meat inspection is, of course, to search for those meats that are not fit for human food and keep them from the market by destruction. That this is effectively accomplished can be seen from the great amount of meats that is annually condemned. It also constitutes an effective medium for the discovery of areas throughout the country containing diseased herds, thereby pointing the way for preventive work.

This information, however, is limited by the fact that the Federal Meat Inspection Law only applies to these establishments that engage in interstate meat business, which at present produce only slightly over 60 per cent of the meat of this country. The remaining 40 per cent is produced in establishments not conducting interstate business, which are, therefore, without federal inspection. Some states and municipalities have local meat inspection laws, but in many cases these are either inadequate or not well administered.

Unquestionably the animals slaughtered in these non-inspected establishments are affected in the same way as those killed under Federal Inspection. This state of affairs ought not to be allowed to continue, for two reasons: First, because the consumption of the non-inspected meats constitutes a menace to public health; and, second, because

these non-inspected meats do not permit an opportunity to institute preventive measures. It is, therefore, imperative that laws, state and municipal, should be passed for the adequate inspection of all meats produced in establishments at present operating without inspection.

There is another way by which the problem may be attacked, especially with reference to tuberculosis in cattle, and that is by more thorough inspection and supervision of milk production than is done at present.

In the light of present-day opinion the only serious danger of infecting people with bovine tuberculosis is through milk. Nevertheless, no uniform laws for inspection of dairy herds and dairy products exist in this country. If uniform laws, state or municipal, or both, or possibly Federal, existed, requiring the testing of dairy herds for tuberculosis and the sanitary inspection of dairies, not only would the danger of bovine tuberculosis be materially lessened, but by discovering and eradicating the disease in dairy cows, 10 per cent of which are at present affected, it would be greatly lessened among beef cattle and hogs as well, thereby materially increasing the meat supply.

So far we have discussed possible ways and means for increasing meat production, and while that, of course, is the most important step in maintaining the supply, much may be accomplished by the consumer to conserve available meats.

We are all familiar with the excellent work of the Food Administrator and the splendid way the country responded to his appeal for reducing meat-eating when necessary.

It is not exaggerating to say that the American people have been too discriminating and often wasteful in the selection of their meats. Partly because of their palatability, and partly because

they permit of quick preparation the more expensive and limited cuts are greatly favored. The so-called cheaper cuts are rich in nutritive and tissue-building elements, and can be made just as palatable as the expensive portions, and ought to be more extensively used.

Another class of meat-foods not fully utilized in this country are the edible organs, although in Europe they have always been prepared and consumed in a variety of ways. The spleen is practically not eaten in this country, except in a few isolated foreign-born neighborhoods in some of the large cities, and there is no reason why it should not be.

According to recent work on the vitamine hypothesis all glandular organs are rich in vitamins, and who knows but that an occasional addition of organs such as the spleen to our dietary might be of great benefit. At any rate, everything points to the spleen as wholesome food of considerable nutritive value, and as the average spleen weighs about two pounds, its use would add many millions of pounds of meat food annually to our supply.

No class of meat-foods is more important than the fats, and their shortage has been most keenly felt during the war.

Immediately upon our entry into the war the Bureau of Animal Industry broadened the inspection regulations so as to save all possible animal fats for food, and the great packing houses improved and perfected their methods of manufacture in the same direction.

The vitamine hypothesis looks upon fats as something more than stored up heat and energy, and it has endowed them with substances, as yet unidentified, that promote growth and enable the tissues to recover from injury.

At first the class of vitamins called "fat-soluble A" was believed to be found in milk-fat and yolk of egg only, but now

that they are known to exist also in beef and hog fat all these fats can be used interchangeably, thereby avoiding a scarcity in any one of them. The broader use of oleomargarines prepared with animal fats would tend to equalize the supply of both butter and oleomargarine.

Naturally, in a realization of a possible shortage of animal fats a search for substitutes was begun, and logically the vegetable fats suggested themselves.

The recent work of Holmes of the Department of Agriculture establishes the digestibility of most of the vegetable oils, thereby opening up a rich supply of fats.

So far as is known at present all of the vegetable oils do not contain vitamins. More experimental work is needed on this most interesting hypothesis.

At no time in the history of the development of the food industries have the advantages of cold storage been so forcibly brought out as during the war. Without cold storage plants, meat and other foods could not have been prepared in such enormous quantities in seasons of plenty and delivered fresh and wholesome to our armies and the Allies abroad.

Now that the war clouds have been dispersed and peace is here, far-sighted men are beginning to take stock of the benefits that can be expected as a result of our victory.

The most able students of the problem agree that great and lasting benefits will result to the human race, even though dearly bought.

Not the least among them will be a broader knowledge of foods, both by the public at large as well as the scientific world.

The war has taught us to get along with less food than we used heretofore, how to substitute one class for another in time of stringency, and how to conserve what we have.