

COMPARATIVE AND RELATIVE VALUE OF TABLE FOODS.

Kind of Food.	Edible Portion or Nutrients.							Market Price per Pound.	Calories per \$1 worth of material.
	Refuse.	Water.	Total waste.	Protein.	Fat.	Carbo-Hydrates.	Ash.		
Hind quarter beef.....	20.2	44.4	35.6	13.6	21.0	.....	.8	12.5	91.20
" " lamb.....	15.7	51.3	33.0	16.0	16.1	.....	.9	15.0	63.37
Chicken.....	38.2	48.6	17.2	15.1	01.2	.....	.9	10.0	33.30
Turkey.....	32.4	44.7	22.9	16.1	5.9	.....	.9	10.0	55.50
Hen's eggs in shells.....	13.7	63.1	23.2	12.1	10.2	.....	.9	25.0	36.62
Oysters (solid).....	.....	87.2	12.8	6.3	1.6	.....	.9	35.0	13.80
Milk.....	.....	87.0	13.0	3.6	4.0	.....	.7	5.0	102.50
Butter.....	.....	10.5	89.5	10.0	35.0	.....	.3	2.5	144.50
Cheese.....	.....	30.2	69.8	28.3	35.5	.....	4.2	1.0	207.00
Potatoes.....	.....	78.8	21.1	2.1	0.1	17.9	.....	.....	.....
Tomatoes.....	.....	90.0	4.0	6.8	.4	2.5	.....	.....	.....
Oatmeal.....	.....	7.8	92.2	14.7	7.1	68.4	2.0	2.5	738.00
Wheat bread.....	.....	32.3	67.7	8.8	1.7	56.3	9.0	2.5	812.00

In answer to questions Mr. Pearce advised the use of $\frac{1}{2}$ of an ounce of salt to the pound of butter. He said that he could not emphasize the question of using the best salt too much. A dairyman should not only take pains to get pure salt, but he should keep it pure by keeping it in a clean, dry place free from all bad odors.

The neatest package, he said, was one filled to within one-eighth of an inch of the top and smoothed off with a straight edge with a circular motion, which would give the top of the firkin the appearance of having been turned in a lathe. An attractive appearance has much to do with the sale of both butter and cheese. In packing butter Mr. Gould would put a little in at a time and press it down with a board covered with a cloth, round the top off and cut it off by drawing a string across the top. This left a rough, granulated surface which was pleasing to the eye. He preferred cloth over the butter rather than paper. In speaking of the danger of freezing milk in hauling to a creamery, he stated that in Minnesota, where they had colder weather, they put a small, round, wick oil stove in the sleigh and covered the cans with a piece of canvas.

Mr. Derbyshire thought that more depended upon the style of the package and the tasty appearance than was generally supposed. In this respect our butter was not equal to the Americans'. He believed that the best butter was made by those who used separators. He would rather have the package well filled up than to have the tubs all the same weight, but if the best kind of packages were used they should all hold practically the same number of pounds. He would always allow $\frac{1}{2}$ of a pound on a fifty-pound tub for shrinkage. He had been using a tin-lined tub with very good results, but for export trade it was not so good, for the English customers objected to it. At a factory near Brockville \$4,000 was paid out for milk from the fifteenth of November until the end of the first week in January.

Mr. Dillon said that at the Mt. Elgin factory in three weeks the patrons had received \$1,400 net.

WELCOME TO INGERSOLL.

In the evening the visitors were welcomed to the town of Ingersoll by Dr. Williams, the Mayor of the town, and Mr. Stephen Noxon, the president of the Board of Trade. After which Professor Dean, Guelph, gave an interesting address on "The foods we eat, with special reference to those from the dairy." In this address he showed that a large amount of food was wasted through a lack of care in the selection of the different foods. The scientific feeding of cattle was very well understood, but the scientific feeding of man was only beginning to attract attention. He stated that the average working man spent about 60 per cent. of his total earnings for food, so that in his case there was a great need of more care, for in many cases the poor man's money was not spent as economically as it might be. This economy did not mean any poorer living, but a more perfect knowledge of the foods employed which enable both a cheap and palatable ration being composed. He showed by means of the accompanying chart the great value and cheapness of dairy goods as articles of food.

The chief use of food was to supply material for the growth of the body, and repair the waste which was continually going on. In the adult the food supplies fuel for the body and furnishes energy and heat. Energy he defined as the power to do work or to overcome resistance. We live by what we can digest and not upon what is undigested, so the value of a food depends to a large extent upon its digestibility. Animal food, as will be seen by a look at the table, is more perfectly digested than vegetable food. Another important consideration in buying food is its composition.

He then showed by the chart that the amount of waste varied greatly in the different foods, being all the way from .38 per cent. in the case of beef to nothing in butter. By referring to the table it will be seen how the different foods compare and also how many calories or units of energy can be obtained from a dollar's worth of the different foods.

American people eat too much fat, as a rule, which causes a wide nutritive ratio, the average in America being about 1 to 6.5, while in Europe it is 1 to 4.5. The standards given by scientists are about 1 to 5, so, to obtain a proper amount of nitrogenous food, we have to eat a large quantity of carbonaceous food, which, in addition to being a source of loss, is an injury to the body. Dairy products provide material for growth, energy and heat in a palatable, cheap and easily digested form.

DIGESTIBILITY OF NUTRIMENTS.

KIND OF FOOD.	Per cent. digestible.		
	Protein.	Fat.	Carbo-Hydrates.
Beef, Veal & Mutton.....	100	96	.....
Fish & Oysters.....	100	96	.....
Milk.....	100	95	.....
Cheese.....	100	95	.....
Butter.....	100	96	.....
Eggs.....	100	98	.....

VEGETABLE.

KIND OF FOOD.	Per cent. digestible.		
	Protein.	Fat.	Carbo-Hydrates.
Flour, fine.....	85	80	95
" medium.....	81	80	95
" coarse.....	75	80	95
Rye Flour.....	78	80	95
Potatoes.....	78	80	95
Corn.....	85	80	95
Rice.....	85	80	95

FOOD RATIONS IN DIFFERENT COUNTRIES.

	Protein	Fats.	Carbo-Hydrates	Calories	Nutri-
	grams.	grams.	grams.	of energy.	tive Ratio.
Machinist (America).....	103	152	402	3190	7.3
Professional men.....	126	152	489	3225	6.6
Mechanics (Europe).....	151	54	497	3085	4.0
Professional men.....	111	111	285	2670	4.7
Guelph Family.....	105	134	417	3386	7.1

AMERICAN STANDARDS FOR MEN AT HARD WORK.

	Protein.	Fat.	Carbo-Hydrates.	Calories.
	grams.	grams.	grams.	
10 oz. Beef.....				
20 oz. Bread.....				
25 oz. Potatoes.....				
4 oz. Butter.....				

Ontario Creameries Association.

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THE RELATION OF CHEMISTRY TO THE DAIRY.

Prof. Shutt, of the Central Experimental Station, Ottawa, was the first speaker the following morning. In defining the terms, chemistry and dairying, he showed that while the former had for its study the composition of all kinds of matter, and the laws that govern the transformation of this matter in nature, the latter had for its primary object the production of milk, and secondly the manufacture of butter and cheese.

He then went on to trace the relation of the animal to the plant, by saying that the production of flesh and the formation of milk was due to chemical changes at the expense of the food consumed. He then proceeded to show that the farmer did not create anything, but merely supplied the material for nature to work over, and that the dairy business consists in skilfully directing the changes in transformation from the plant into butter. The laws which governed the economical and profitable production of these two classes of products were alike made intelligible by the science of chemistry.

Continuing, he said that the fertility of the soil was due, in the first place, to the amount of plant food in the soil, and secondly, upon the availability of this plant food. The plant food which was locked up in the soil could be made available by thorough culture and underdraining.

Chemistry also tells us why we manure, tells us what substances are taken out of the soil by successive cropping, disposes of the popular idea that all manure is the same, shows us the great loss of plant food which results when the best part of the manure is allowed to run off, and enforces the economy of saving the liquid manure.

Prof. Shutt then proceeded to give the results of his analysis of samples of muck which had been experimented upon at the Experimental Farm. He had found that the samples were all very rich in the most expensive constituent of manure, nitrogen. On the average they contained about thirty pounds to the thousand pounds, though this amount is not all available at once. He would place the value of this nitrogen in a ton of muck at about \$2.50, and besides this there is a certain amount of potash and phosphoric acid. Muck has a very high value as an absorbent. Muck also supplies humus or vegetable matter to the soil. This was the secret of the great fertility of the soils of the Northwest and Russia. Another beneficial effect of muck was the production of carbonic acid by its decomposition in the soil, and this still further helped to break up and render available for the plant the fertility of the soil.

Continuing, he said that it was not alone in the food of the plant that chemistry aided the dairyman, but also in the subject of cattle food. Chemistry

told us what to feed, how to feed, in what quantities, and how much should be given of each special food. Chemistry showed that foods were composed of two parts, the albuminoids and the carbo-hydrates; that the albuminoids were the most expensive; also how this expensive part could be obtained from the atmosphere by means of leguminous plants, as peas, clover, etc.; and lastly, how to form a cheap ration, which would have all the necessary constituents for the production of milk united in the right proportions. Chemistry proved the necessity of a succulent food for cows, explained the production of a sweet ensilage, told us when to cut the corn and how to sow it.

In relation to dairy products chemistry had come to our aid in exposing frauds of all kinds, had given us the greatest invention in dairying, viz., the Babcock test.

THE BUTTER THAT IS WANTED FOR THE MARKET.

Mr. A. A. Ayer, of Montreal, followed with a practical talk on "The Butter Wanted and Proper Method of Securing the Same." He began with the feed, and said that farmers should exercise great care that their cows were not fed tainted feed or musty hay, as such foods were sure to injure the butter. He emphasized what Prof. Shutt had said upon the necessity of giving cows pure water. Cleanliness in the milker and all the surroundings of the cows was of the greatest importance, because it was easy to get a bad flavor in the milk, but impossible to strain it out again.

The same care should be exercised in keeping the milk free from all taints, for nothing will absorb bad odors more readily than milk.

One reason why he favored the use of the separator was that the separation of the cream could be completed at once, and it was much easier to protect a small quantity of cream from taints than the larger quantity of milk.

In the creamery the utmost cleanliness must be observed as well, and all carelessness avoided. He preferred the hand working of the butter to machinery, in order to obtain the proper consistency and grain for packing. Great care should be taken to guard the salt from exposure to taints of fish, oil, tar-paper, etc., for next to milk salt would absorb flavors quicker than anything that he knew of. He urged the use of parchment paper in all tubs, as a preventative against the absorption of flavors by butter. He had found in his experience as a butter exporter that the best package was the keg holding 112 pounds—safest and best in every particular. In conclusion, Mr. Ayer dwelt upon the need of giving our butter a more attractive appearance, and stated that no country was receiving a better average price for its butter than Canada, and that this price would only increase as the quality was improved.

GOOD ROADS IN RELATION TO THE DAIRY.

Mr. Pattullo, of Woodstock, delivered an address on the relation of good roads to the dairy. He briefly referred to the history of road making in past ages, and the relation of roads to the civilization of a country. He stated that the bad roads of Ontario cost the province more than good roads would. To illustrate this point, he estimated that each of the 350,000 work horses of Ontario were kept idle at least one month out of the year by reason of the impassable condition of the roads. At the small sum of one dollar per week, this enforced idleness would show a loss to the country of \$1,500,000 in this way alone, without speaking of the tax or broken vehicles, and the ruin of the feet and legs of horses, owing to the poor roads.

There were about 2,000 dairy factories in Canada. The average cost of what might be called the haulage would not be less than \$1,000, or \$2,000,000 in all per annum. It was quite certain, then, that a saving of one quarter of this could be saved by a reasonable amount of improvement of the roads.

The speaker then referred to the social influence of good roads. He did not think that the best system would be to put the roads under government control, but that the country should control the main roads, and that the townships should have the supervision of the lesser roads. He looked forward to a time when we should have men especially trained for the work as superintendents of road divisions, and when the work would not all be done in a week as at present, but would extend over the entire year.

SECRETARY WHEATON.

J. W. Wheaton, Secretary of the Dairymen's Association, addressed the meeting on "The Relation of the Patrons to the Creamery." He showed that the success of the dairy industry depended upon co-operation, the three factors being—the manufacturer or company, the cheese or butter maker, and the patron. The manufacturer's duties were to provide a suitable building, properly equipped. He should also keep the patrons well posted as to the business. The maker's duties were also very important, for upon the proper performance of them the success of the co-operation will largely depend. The patron is just as important a factor in maintaining the co-operation as either of the other two. The patron, instead of thinking that he was accommodating the manager of the company by sending milk, should look upon it as a direct benefit to himself, for the profit arising from this style of farming is greater than any other, and at the same time it will enhance the value of the farms of the patrons.