A STUDY IN TYPE.

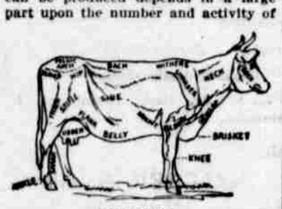
SOME ANATOMICAL AND PHYSIOLOGICAL FEATURES OF THE DAIRY COW.

Intelligent and progressive farmers and dairymen are becoming more familiar with the fact that milk and butter producing qualities of cows are accompanied by a general vigor, conformation, temperament, fineness, bearing and other features that are quite characteristic, says a bulletin of the Storrs experiment station. The accompanying figure shows the outline and general features of a profitable cow of the dairy type.

The general constitutional vigor of the cow is of primary importance, and of nearly as great importance are efficient digestive organs, large and well formed milk organs, strong heart and good blood circulation, large, strong lungs and a highly developed nerve system. For convenience in the present discussion these are called the essential organs and are considered here with some remarks concerning their uses or functions.

Milk is a manufactured article produced by the cow from the food which she consumes. The capacity of a cow for producing milk depends largely upon her capacity for digesting food and assimilating it into her tissues. For the accommodation of a large and efficient digestive apparatus a good dairy cow should have a long, deep and wide barrel, with well sprung ribs. This form of middle piece gives ample room for the storage of food and for an apparatus capable of disposing of large quantities of the coarse, bulky fodder which the cow consumes.

The milk organs are quite intimately concerned in the productive capacity of the cow, as it is in these that the milk and butter fat are finally elaborated from the food. It is not altogether clearly understood how the milk is made in the gland, but it seems quite probable that it is produced by the epithelial cells within the udder. So far as is known, the quantity of milk that can be produced depends in a large part upon the number and activity of



DAIRY TYPE.

these cells. The number of such cells is limited by the size of the udder and the amount of fatty tissue it contains. The dairy cow should therefore have a large udder capacity—the larger the better—but the size of the udder should not be due to any large amount of fat or flesh. There should be an elasticity of the tissue, with a shrinkage of the udder when empty. The udder should have considerable surface, extending far forward and well up behind. It should be well balanced and symmetrical in shape, indicating good development in all quarters, for the more perfectly developed the organ is the larger the amount of milk it will be likely to yield. It should be spread considerably from side to side also, while the teats should be even and squarely placed. To make room for such a capacious, well developed udder the hind legs of the cow should be wide apart, the thighs should be thin and the flanks high arched.

The digestive tract prepares the food for assimilation into the tissues, the udder elaborates the milk, the heart forces the blood with its load of food and oxygen through the body, the lungs supply oxygen to the blood and remove from it the products of the oxidation which takes place in the body, but the brain and nerve system are concerned in all these operations. Through the influence of this system the activities of all the organs are aroused, guided, controlled and harmonized.

In the cow the heart and lungs are ever active. The digestion, absorption and assimilation of food, and perhaps the mysterious elaboration of milk, are constantly going on. Collier estimates that a cow giving an average quantity of milk produces, on an average, 138,210,000 fat globules per second during each 24 hours. This and the secretion of the other constituents of the milk illustrate the amount of activity in the milk organs alone and suggest the need of a highly developed nerve system. The more pronounced of the outward signs that indicate this nerve development are a bright, lively and prominent eye, this prominence causing a dished face; a wide forehead; a wide junction of the skull and spinal column, indicating a large brain; a large, prominent backbone, giving room for a well developed spinal cord; a long, slim tail, and considerable energy and vigor and style of action.

Process Butter.

Here is a description of process butter: "This butter is made from old, rancid and useless dairy butter purchased from country store keepers in the states farther west and shipped in old barrels, tobacco pails, shoe boxes, etc., which appetizing mess is put through a process of boiling and renovating to remove the nauseating odors and through other treatments which have brought it under the ban of the pure food laws of several states, after which it is worked over in sweet buttermilk, which gives it temporarily a fairly clean flavor." See that this stuff is not worked off on you by your grocer. The "green" woods are full of it. —New York Press.

OUR CHEESE INDUSTRY.

Foreigners Afraid to Buy on Account of Misrepresentations.

A leading cheese exporter who is quoted in the Boston Transcript states that the total production of cheese in this country at the present time is figured at about 265,000,000 pounds annually and that we export about 70,000,000 pounds of this amount. He figures that the home consumption is about 260,000,000 pounds, including about 12,000,000 pounds of foreign cheese that is imported. If these figures are correct, our exports of cheese are very much larger than they were last year, which are given by the treasury bureau of statistics at 38,198,753 pounds for the fiscal year of 1899. Most likely the Boston exporter's figures are exaggerated, but it is probable that we shall show a considerable gain in our exports for this year. Since the crusade that has been made against "filled" cheese our cheese has recovered some of the reputation that it lost. There is a demand for further legislation to prevent the counterfeiting of well known brands of cheese in order to restore the prestige of these different makes. Congress is being urged to give our cheesemakers the benefit of laws that will enable them to compete with the Canadian dairymen, who have developed a large export trade in recent years at our expense. It is believed that with laws that guarantee the genuineness of our cheese products we might recover the former high position they enjoyed in foreign markets. It is pointed out that American cheese is in some cases bought by Canadians and shipped to Great Britain as a Canadian product, finding a ready market. Our dairymen make as good cheese as can be found in the world and should have a considerable share of the foreign trade. What they need in order to occupy a more prominent position is legislation that will convince the foreign consumer that he is not being deceived, but is buying cheese that is exactly what it is represented to be.

White Spots In Butter.

A correspondent writes us that he had a Jersey heifer the butter of which was injured by white spots, supposed to be due to minute clots of curd, says The Rural New Yorker. The condition was remedied by giving every night one-half tablespoonful of cooking soda. We have submitted this to Professor Law of the New York State Veterinary college, who says if the white spots are really minute clots of curd the explanation can be made on a purely chemical basis. The most common cause of clotting is the development of acid in the milk and the presence of an excess of salts of lime. The lime salts especially determine a firmness and insolubility in the coagulum. The giving of bicarbonate of soda in small doses tends to increase the secretion from the stomach and thus to improve digestion, assimilation and secretion, including the condition of the milk. The increased secretion from the stomach implies a greater flow of hydrochloric acid, but in the presence of soda this is soon resolved into chloride of sodium, or common salt, which is no longer acid. The surplus soda salt circulating in the blood and secreted with the milk to a certain extent bars the early formation of acid in the milk and the resultant souring. Again, the soda has stronger chemical affinities than lime and tends to take to itself the acids that go to make up the salts of lime and thus to diminish the amount of lime present in the milk and the tendency to firm clotting. Even supposing the white spots should have been due to the growth of a ferment (bacterium), this must be a germ that finds its proper home in a sour (acid) medium, and the increase of the alkaline soda, by hindering souring, would for a time keep the medium in a condition in which such a germ fitted for acid media could not grow.

Green Alfalfa For Cows.

During the summer of 1899 the Kansas Agricultural college fed ten head of cows on green alfalfa for a period of 74 days. During this time they received 77,145 pounds of alfalfa and 1,623 pounds of corn and Kaffir cornmeal. On account of other experimental work it was impossible to retain the same field of alfalfa through the entire period, and consequently we could not measure the area used; but, figuring on the basis of dry matter produced and comparing it with the amount produced by an average yield of four tons of well cured hay per acre, we find that it took 2.97 acres to keep ten cows 74 days. During this time these cows yielded $85.69 worth of butter fat and skimmilk. The grain cost $10.65. This leaves $75.04 to be credited to the green alfalfa, amounting to $1.95 per ton, or $25.26 per acre. Green alfalfa is relished by the cows, and a field can be kept in good condition for feeding during the whole summer. Where pasturage is abundant it will doubtless not pay to feed green alfalfa, but where pasture land is scarce or the grass becomes short or dry green alfalfa furnishes an excellent feed and will not only keep up the flow of milk for the time being, but will help materially to maintain a large flow through a longer period of lactation. Pasturing alfalfa will sometimes cause cows to bloat. We did not have a single case of bloat from cutting alfalfa and feeding it green.

Calf Feeding.

"I see a great many of your readers have trouble raising calves on separator milk," says a correspondent of Hoard's Dairyman. "I have used a separator for three years and never had any trouble. I will give my plans of feeding them. If it will be a benefit to others, you may publish it. I feed the calf the first few days on the milk of its dam. This is set in pans or crocks for 12 hours, and then the cream is taken off, and the milk is warmed to 90 degrees and given to the calf. When the calf is 2 weeks old, it will eat bran and a little cornmeal. After this it is given separator milk until it is 6 months old, and then it is turned out on grass. I raise nothing but the fall and early winter calves, so I have the milk in the spring and summer for the pigs."

Imitation Cheese.

In 1899 the imports of imitation cheese into Great Britain from the United States and Holland, the only countries where it is made, were 5,687 hundredweight, which was less than one-half the amount imported in 1897. Popular sentiment has been so strongly against the article on both sides of the water that it was expected the trade would gradually die out. Recent high prices for pure cheese have, however, induced a few concerns in Great Britain to handle the imitation stuff, and they have inquired for supplies both in Canada and the United States. To the credit of Canada it may be said that the law positively prohibits the manufacture or sale of the article in any of the provinces of the Dominion.—Farm, Field and Fireside.

Butter Cultures.

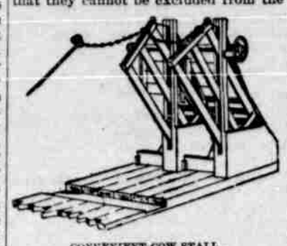
One of the acknowledged experts in this country on the subject of ripening cream is Professor H. W. Conn of Connecticut, who is the introducer of the system of artificial butter culture and the discoverer of the famous bacteria which produce the June butter flavor, says The American Cultivator. In his new bulletin No. 21 he discusses various methods of compelling cream ripening by use of starters and butter cultures. The Danish method is to pasteurize the cream and then add a pure culture of the right kind of bacteria. This produces a mild flavored butter which, however, is not so well liked in this country as that produced by natural starters. To make a natural starter, take the milk from a perfectly healthy cow. The first few jets of milk are rejected and the rest drawn into a sterilized vessel, which is immediately covered, heated to a proper temperature and the milk passed through a separator. The skimmilk thus obtained is set aside in a covered, sterilized vessel to sour. When well soured, it serves as a starter for the cream ripening process. In conclusion, the professor observes that the use of any kind of starter will not make good butter out of poor cream.

BACTERIA IN MILK

HOW THEY ARE DEVELOPED BY TEMPERATURE AND SURROUNDINGS.

Bacteria are minute plants, frequently not more than one twenty-five-thousandth of an inch in diameter and pervading air, water and soil everywhere, says Professor W. H. Conn in The American Agriculturist. They multiply so rapidly that a single individual may produce 17,000,000 offspring in 24 hours. Their importance to agriculture consists in their power of breaking up various compounds and also secreting from their bodies certain chemical products.

The kinds of bacteria which occur most commonly in milk may be called dairy bacteria. They are so common that they cannot be excluded from the



CONVENIENT COW STALL.

milk by any practicable means, but their numbers may be reduced. There are many uncommon kinds which when present cause great mischief, but these may be excluded altogether by care and cleanliness.

So far as concerns the milkman, bacteria are an unmitigated nuisance, being the cause of souring and other undesirable changes in the product. The common dairy bacteria as they grow produce a chemical change in milk sugar and convert it into lactic acid, which gives a sour taste and finally causes the milk to curdle. This change cannot be prevented, but it may be postponed by reducing the number of bacteria. The first means of reduction is by cleanliness, carefully washing the milk vessels, and more attention to the clean condition of the cow. The second means is by regulation of temperature. When freshly drawn, milk is about 100 degrees, a temperature favorable to rapid growth of dairy bacteria. Cooling the milk immediately checks their growth greatly.

It is necessary, however, to emphasize the need of immediate cooling. Half an hour or an hour after milking the cooling will be of very much less value than if done at once. During this half hour the bacteria have already become very numerous. It sometimes happens that night's milk keeps better than that of the next morning because the night's milk was cooled at once, while sometimes the morning's milk is put into the cans at once and taken into the city without cooling. The two chief agencies to prevent souring, then, are cleanliness and low temperature. The same means will prevent all the other bacterial growth which causes slimy milk, tainted milk and other peculiar conditions.

Milk from a healthy cow contains no bacteria, but by the time it has reached the milk pail it is already contaminated to a surprising extent, containing from a few thousand to 150,000 germs to the cubic inch, sometimes more. These are obtained chiefly from four sources—the air, the milker and his clothing, the milk pail, the cow. They are always floating in the air, especially if hay is fed during milking. They are likely to be on the hands of the milker to some extent, and his clothes are teeming with them. Milk pails not completely clean contain a large number, but the greatest source of milk bacteria is the cow. The germs get into the teats through the milk ducts and between one milking and the next multiply rapidly. The first milk taken from the gland washes these bacteria into the milk pail.

Cow Comfort.

The man who at this season of the year provides some kind of shelter from the sun for his cows is going to receive a big interest on his investment, says Hoard's Dairyman. A cow to return a profit from the feed she consumes must be comfortable, and comfort is not found where the animal is required to stand under a blazing sun or hunting for a few mouthfuls of dried grass over a drought stricken 40 acre pasture. Butter is a slippery article, and it slips away easily and quickly when its factory is required to spend three-fourths of the time fighting flies. A cow will appreciate shelter on a hot day as much as, if not more than, a man. Cool water and a corner sheltered from the sun, together with a breeze to keep the flies away, will go as far toward filling the milk pail as heat, flies, poor water and dried up pasture will produce the opposite. Costly shelter is not necessary, but some old boards and straw, together with a few hours' work, will go far in producing cow comfort.

Aeration and Cooling.

Makers of milk who have not yet learned the value of aeration and cooling are lacking in fundamental education of their calling, says The Breeder's Gazette. Cleanliness, aeration and cooling will do much to preserve milk pure and sweet during the hot weather approaching and do away with the temptation to use preservatives. Creamerymen are especially interested in spreading the knowledge of the benefits to be derived from the use of the simple cooling apparatuses on the market, as the success of their summer output depends on the condition of the milk when delivered to them.

CREAM SEPARATORS.

Their Advantages For Farmers With a Few Cows.

Cream separators were not thought much of until recently, says William Swan in The Prairie Farmer. Now their use is becoming widely spread over the entire west. Every farmer who has six or more cows is obliged to have a separator in order to get good results from dairying, either on a large or small scale. The time is coming and is near at hand when every farmer who has few or many cows to milk will have a cream separator. Still there are any number of farmers yet who do not realize how much profit they are losing every day by not using a separator. They have heard others tell of their experience with a separator, but paid little attention only for the time being. One thing they object to is "paying such an exorbitant price," as they term it, for a separator, but they do not hesitate a moment at the price of any other piece of machinery used on the farm. The cream separator is used more than any other machine on the farm, you might say, as it is used twice a day 365 days in the year, and it brings in more dollars than any other machine. Of course there are other machines that must go hand in hand with the separator. I wish I could impress upon the mind of the farmer who has not a cream separator this thought—that whatever you do you wish to receive as great a compensation as you believe you have honestly earned. Now, you earn more than you really get for your milk at present. You must remedy that leak as quickly as possible for your own special benefit. I am not an agent for separators, as some may suppose, but would merely give some facts as regards them. The cream separator that will separate all of the cream and only the cream from the milk is the kind to buy. Here are a few benefits to be derived from the use of the separator: First, you can get the cream out of the milk immediately after milking, and thus you will only have to care for the cream; then the skimmilk can be fed in its sweet, warm state to the calves and pigs; second, the milk becomes cleansed from all particles of dirt when separated; third, the finest butter is made from the cream, and it will command the highest market price.

How Oleo Is Made.

Notwithstanding the protests of the oleo trust and its friends in congress, the various formulas for making oleomargarine have been made public, and they are at least interesting, says the Philadelphia North American.

One of the processes for making the kind of butter that is sold in Pennsylvania as a dairy product is thus described in the patent office records:

"The process consists in first forming a soap emulsion of the fats or fatty oils with caustic soda; then precipitate the lyes; then applying chlorinated alkaline lye or chlorinated gas to the soap emulsion."

That sounds like a recipe for making soft soap, but when the color is added the result is gilt edge "creamery" butter for the Pennsylvania market.

Here are a few of the constituents of the "advanced product of the farm:" Bisulphate of lime, borax, salicylic acid, benzoic acid, orris root, cottonseed oil, bicarbonate of soda, glycerin, capsylic acid, alum, capsic acid, sulphate of soda, cows' udder, sulphuric acid, pepsin, tallow, lard, salt, cornstarch, butyric ether, caustic potash, castor oil, chalk, slippery elm bark, caul, oil of sesame, oil of sunflower seed, olive oil, turnip seed oil, broma chloralum, chlorate of potash, oil of sweet almonds, oil of peanuts, peroxide of manganese, stomach of pigs, sheep or calf, nitrate of soda, mustard seed oil, nitric acid, dry blood albumen, sugar, butyric acid, bicarbonate of potash and caustic soda. One cent a pound is a very modest rate of protection for such a formidable array of mineral and organic poisons and abominations.

Skimmilk as an Insect Destroyer.

It may not be generally known that skimmilk or buttermilk readily mixes with kerosene, forming an emulsion which destroys insects without the danger of injury to animals or plants on which they might be that might result from the use of the pure oil or of oil and water. We first learned of this from using this mixture for the scale insect, or mite, which causes scaly legs on fowl. We found that one or two dippings or washings with it would cure the worst case of scaly leg and leave the skin as smooth as when first hatched. We never had occasion to try it for lousy animals, for we never had one, but we do not hesitate to recommend it, and we have lately seen its use advised for ticks on sheep, using a gill of kerosene to one gallon of milk. We did not make our mixture so strong of kerosene as that, but perhaps the larger tick may need a stronger application than an insect so small as to be scarcely visible to the naked eye.—American Cultivator.

Cows' Taste In Music.

I am not an agriculturist, but for ten years I lived with an uncle who kept cows. We had several changes of cows and milkmaids during that period. It was noticed that certain milkmaids could draw more milk than others. Our most characteristic cow was Trieste, so named on account of her sad bearing, and it required the most touching of border songs to prevail upon her to give a decent supply of milk. The old woman who generally milked her always wound up with "The Land of the Leal" to get the creamy ending of the milking process. A new hand once tackled Trieste with sea songs, with dire consequences. Another cow was called the Evangelist on account of her intense hatred for psalm tunes and Sankey hymns. She, strange to say, preferred rollicking tunes.—London Chronicle.

FAILURE WITH ALFALFA.

Some Ideas About the Cause and How to Prevent It.

In some sections of the west where alfalfa could be easily grown it has not become popular because, the farmers say, it will not succeed on account of being choked out by weeds or of failing to give a good second cutting, with no third cutting at all.

From a study of the failures in growing this crop it seems that the method of growing is at fault, according to a writer in Farm and Fireside, who says:

As a general rule, the ground is well prepared in the spring, the seed sowed at once and a good, promising stand obtained, but in the autumn what alfalfa there is hides among the foxtail and other weeds. Few or no plants appear the following spring, and the farmer after perhaps another trial or two gives up.

If this method were abandoned for the following, there would probably be more fields planted to this crop: Prepare the land—five acres is a convenient area—a year or two previous to sowing by growing well tilled corn upon it. In the spring sow an early maturing crop, such as early planted soy beans or oats. Harrow the ground after this is off each two weeks until the autumn rains commence. Plowing will not be necessary unless the stubble in dense. This harrowing will improve the soil and kill several crops of weeds. After the ground has become wet sow the alfalfa. If it does not become wet, postpone seeding until the spring.

The best method of seeding is to cross drill, the seed being mixed with an equal quantity of sand, bran or other substance, or the drill being set so as to sow only half the quantity at each operation. In this way half the seed is sown across the other half. As soon as the plants reach a height of six inches they should be mowed. This, if practiced two or three times, will kill weeds and help the alfalfa. It should be done, weeds or no weeds.

Don't cut alfalfa as you would clover—after full bloom. Cut before the maximum bloom and for the first spring cutting even earlier. This will insure heavier late cuttings. As final cautions avoid loose, dry ground, let the soil settle and become moist, avoid late cuttings and avoid pasturing until the third year.

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