

The Dairy.

Exercise for Cows.

BY L. B. ARNOLD.

The amount of exercise which an adult cow requires is but very little, and all she gets beyond what is necessary for her health occasions a draft upon her system which must be made up by extra feed or a loss in her milk product, or perhaps both effects may be apparent. Every expenditure of force, whether in locomotion or labor, is made at the expense of the food consumed by the animal exerting the force. There is no evasion of this rule, and he who causes his animals, whether milch cows or beasts of burden, to make exertions that could be avoided, is wasting his means of profit. The man who, having a given load to move twenty miles, takes a path that will require twenty-five miles to reach his destination, is not more unwise than the dairyman who causes his cows to do twenty-five per cent. more travelling and exertion than is necessary to supply themselves with food. This may seem like spinning a fine thread, but it is the sum of such threads that determine the question of profit with the dairyman. The loss in milk production by more travel in grazing than is necessary for maintaining the health and vigor of a herd of cows, is often very considerable. Very few herds are free from some loss in this direction. In woodland pastures and rough and hilly ones, and in ranges necessarily large because the land is poor and feed scanty, the yield of milk is always inferior, being cut short by the long distances necessary to travel for gathering a supply of food. The loss in milk from feeding in pastures of such a character as to require cows to be all day in filling themselves, may be plainly seen by any observing farmer. A difference of 25 or 30 per cent., and even of 50 per cent., will be easily made between such fare, and a full supply of feed easy of access either by grazing or by soiling.

Large ranges of pasture are not advisable for cows in milk. It is better to supply only pasture enough to furnish grazing till grass begins to fail from dry weather, and to supply the herd with soiling crops through the middle of the summer, at least. The saving in land where land has much value, is enough by this course to pay for all the extra labor it occasions, and the increase of milk which will be gained becomes a source of increased profit. One would hardly imagine, until he tries it, how much the yield of milk for the season will be augmented by such a course. In the first place it saves the cows an immense deal of travel, if they can have their feed presented to them in the stable or other convenient place, instead of their having to run after it. Then, it often saves them a great deal of depressing exposure to sun, and storms, and flies. They are enabled also to make better use of the food they consume by reason of having more leisure for ruminating than they can have if they have to pick their living by constant travel. The sum of all these advantages has a telling effect upon the resources of the farmer, and he cannot afford to ignore them. If he has rough places, woodland or thin pastures, which will afford only scanty feed, it is better to put young stock upon it to pick the scanty feed. They can use it without loss. They require considerable exercise to work off their surplus energies, and to promote growth of frame and assimilation, and they won't mind the travel necessary to gather the grass from such places. But the milch cow which has her energies taxed to their utmost to elaborate a bountiful flow of milk, has no vital force to spare. She needs to husband to the best advantage all she has, to enable her to do her full work, and the farmer who intelligently plans his operations will spare her all the exertions he possibly can.

Betterments in Butter-Making.

BY JOHN GOULD, OHIO.

Before we take into consideration the employment of improved mechanism in the dairy, we had best understand some of the elements which are the base or foundation upon which good butter and its production rest. The cow is first to be considered; but for now we will assume that our cow is a good one, of full blood or a fine grade, and fed on well cured hay and corn meal. The question, "What is butter?" would, by a greater number of people, be declared to be animal fats; but this is only true in part, for butter is largely composed of vegetable fats; this is known from the fact that the flavoring oils of onions and other vegetable substances of peculiar flavors, are transmitted to the butter, rather than transformed, which would be impossible were they decomposed and assimilated, for this "recomposition" would remove their obnoxious flavors. Again, as the color of foods influence the color of the butter, we again are confronted with similar facts, that the essential oils of vegetable matter are taken up by the blood unchanged, and conveyed to the udder where it is, by the cellular process, decomposed into milk.

As several of the elements of butter are not found in vegetable matter, we then may assume that by some mysterious process they are created by combination, and are known as new elements, whereas it is possible that they are only elaborated from existing material, and to this is due the presence of the volatile and flavoring oils; at least this is now considered probable by our leading authorities, especially Prof. Arnold, who, as an investigator, probably now stands without a peer in the dairy world. This is given to show that the character of the food is quite as important a fact to which attention should be directed, as to enquire into the properties of dairy apparatus, for if choice is to be had between careless feeding and costly apparatus, or no apparatus and judicious feeding, the last would be by far the most preferable. No fine product can be made from inferior foods, and it is not wholly improbable that within a few years we shall be feeding "butter foods," and the cow will become a machine to give a flavor and texture to butter that no chemical art can approximate to, or even counterfeited.

Then we have one other inquiry to make, and that is, "why the butter fats separate from the milk?" for it is on this complete separation upon which the economy of dairying depends. If there were only the fats in the water of the milk, cream rising would be a very simple problem to explain, but as there is quite as much casein, or cheesy matter in milk, as fats, another element has to be overcome. In one sense cream does not rise. Actually, it is the serums that fall, for the cream globules do not change their density by becoming colder, but the serums do, and what in the warm milk actually is no difference in specific gravity, becomes marked as the milk is cooled, and the gravity draws the heavier portions of the fluid down, and this crowds the lighter portions or fats to the surface, or stratifies it, just as water forces oil to rise by occupying its space, after being shaken violently.

Then some one asks, "why all the cream does not rise if this is the case?" for absolutely perfect skim milk can not be produced, its nearest approach being accomplished by the centrifuge, but this even is not quite perfect. The supposed reason can only be answered mathematically, by asserting that the smaller globules of cream (and it is these and not the large ones that remain) offer more resistance to this descending serum than the larger ones, and thus are either held in perfect

equilibrium or are carried down instead of being forced up; in other words the solid contents of a globe are to each other as the cubes of their dimensions, while their surfaces are as the squares of their dimensions, so that this remaining cream in the milk is of these globules of fat which are of such infinitesimal size that they lose their motion, and so remain at rest and can not be secured.

Now we hope we stand on clear ground, so that the employment of a patent or modern creamery can be better understood, for to work in the dark with one is to continue the "guess work" features of the old methods. The plan of one and all of these modern creameries designed for the home dairy, is by a sudden cooling of the milk to produce a marked change, or difference in these specific gravities of casein and fats, and by this instantaneous cooling reverse the order and send the cream up, and by this process cause a greater number of these cream globules to rise, and by making the milk poorer, cause a corresponding increase in the butter product, a fact which is usually attained as the success of these different patents testify.

As we have no interest in any of these patents, that which I may say respecting their merits might seem one-sided at best; but speaking from honest conviction, my preferences might lead me to select one that has ventilation along with rapid cooling. Those with covers fitting over the can and designed to be water sealed, fail, in theory at least, of making the finest flavored butter, for if there is any truth in the oft repeated idea that cream will absorb odors, then the animal heats which are first expelled from the milk by rapid cooling are condensed upon the cover and are again re-absorbed. Such cans with ethical covers, quite pyramidal in form, which would allow this condensed vapor to run along the inner surface and thence seek the water at the sealing line, would in part remedy this, but a small cap screw in the apex, which could be taken on while the milk was cooling, and then instantly made air tight by replacing, would, to my individual notion, be nearest perfection. Nor am I an advocate for the extreme cooling by the use of ice, for if the cream is reduced in temperature to the point of chilling, a difficulty will be experienced, not unlike the chilling of cream in the winter, which is so objectionable. Water at a temperature of about 50°, if it can be had in abundance, is all that can be desired, if butter of uniform and high quality is wanted, for radical changes are not the best systems to indorse in any patent. Cream is neither divested of any of its peculiar characteristics nor has them added to by the employment of improved apparatus. The objective aim is butter by any method, and what will destroy or impair flavor or texture by our plan, will not result differently by any apparatus unless the conditions are changed. Flavor, texture, grain, aroma, and quality are all reached finally by one system, though the workings may appear seemingly different.

The International Dairy Fair.

The International Dairy Fair Association held their annual meeting on Tuesday, the 13th of Feb. There was a large attendance of members. After the election of President Moulton, he delivered his annual address, for which, we regret, we are unable to find space. Suffice it to say it was a masterly production, and replete with valuable information for the dairyman and farmer.

Doubtless the most important subject discussed was that of a proposed fair to bring together the producers of the world for an examination of the products of all sections, and a general discussion of methods, systems and improvements. A resolution that such a fair should be held in New York this year was unanimously adopted.

The more frequent the actual producers of the country can be brought together, the better will it be for the marvelous interests they represent. Hence, when in agriculture, the farmer, or in any other industry, the producer, is attracted from his field of labor to discuss with practical men of like application the methods and experiments that concern all, and to compare notes with one another on the new features that are constantly presenting themselves in their management, a great benefit is guaranteed to all.