FOUNDED 1866

be successfully grown as late as late crop should command a on the Montreal and the Boston J. B. DANDENO. nt.

E DAIRY.

Buttermilk.

mer's Advocate'': y by-product we shall consider ermilk, which is the material ream has been churned, or what d when the fat of the cream has d into what is commercially Buttermilk more nearly er. lk in composition than it does product. It has about 90 per d 10 per cent. of solid material. nitrogenous matter, sugar and great deal in its composition. ning as much as one-half to one but usually about one-quarter of ne special point about buttermik lactic acid which it contains. travagant claims have been made ur milk as a means for prolongported that a people in Southern r their longevity, use sour milk iet. In consequence of this, and s attributed to a well-known there have arisen a number of cts which are claimed to have ting and healing properties for After making due allowance t of the facts, due to the enin persons, who incidently erfortune from the too easily humere is undoubtedly a wide and e utilization of buttermilk more he case at present, in assisting the injuries of reckless manking their health. The mild lactic k tends to overcome an alkaline e human system, aids in the d, stimulates the secretion and elimination of waste

material, and also tends to dissolve limy deposits in the arteries and elsewhere, which cause impaired circulation of the blood and that general / "stiffness" which comes with advancing years. The young human is, as farmers say, "limber as a cat," but he soon becomes bent in posture and unmis-takably and painfully non-pliable in his body.

We read recently of a noted Irish WDO

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then we should be taking the first step towards breaking up what is admittedly one of the greatest curses of mankind-the drink evil. Leaving the human side of the question, let

us look briedy at the relative feeding values of these three dairy by-products for feeding pigs as determined during two years' tests at the U.A.C. A part of these data have already been given, but we shall bring the matter before readers in concise form in this the concluding article of the

series RELATIVE FEEDING VALUES.

By-product	1908	1909
Separated Whey	$100\\125$	100
Buttermilk	160	172
Skimmilk	103	129

It will be noticed by the foregoing that in 1908 the ssimmils had a higher relative feeding value for pigs than did the buttermils, but in 1909 the buttermilk was much superior. The probable explanation of the high feeding value of the buttermilk in the second year's tests, is the fact, that during that summer we were conducting a number of experiments in churning pasteurized sour cream and the buttermilk tested abnormally high in fat, frequently going so high as .5 to 1 per cent. In no other way can we account for the exceptionally high returns in feeding buttermilk to hogs as were got that year. Under ordinary conditions the skimmilk has generally given better results than either of the other two by-products. In commercial work, of course, it does not pay to feed milk-fat to hogs; consequently buttermakers in creamerics and on the farm try to scure as exhaustive churnings as possible, as fat at 25 to 30 cents a pound is rather expensive feed for pigs, even though they may be selling around ten cents per pound live weight.

Summing up our argument with reference to the by-products of the dairy we should like to emphasize :

1.—These are among the most valuable foods on the farm for live stock. For the very young animal there is no satisfactory substitute for skimmilk. Our live stock interests are among our most valuable assets in Canada. While grain relatively high, just at present, owing to abnormal conditions, the man who intends to remain permanently in agriculture at one place, must keep animals to restore and maintain the balance of nature.

2.-Skimmilk and buttermilk are also valuable human foods. They contain all the elements found in new or whole milk, though the fat is usually quite deficient. However, they contain a higher percentage of ash and proteid or muscleforming material than does new milk, hence are especially valuable for the growing person who needs to build bone and muscle for a sound body, which is essential for the highest type of human service.

In addition, buttermilk contains a valuable digestive agent, and has stimulating properties of great virtue. Skimmilk may also be made into butternilk, if so des red, by introducing, or by allowing to develop, the lactic ferment. After the skimmilk thickens it should be churned to give it a smooth consistency, which is characteristic of good buttermilk. Those farmers who are convenient to town or city can usually dispose of all buttermilk at prices nearly equal to the value

2. There must be an abundant supply of both pollen and honey.

THE FARMER'S ADVOCATE.

3. The amount of brood supplied should be limited in quantity in order to concentrate the working force of the colony, and it should embrace eggs just hatching or larvae not over one day old.

4. The temperature must be warm enough not to chill the brood.

5. Drones must be flying.

Other influences which can be brought to bear on these natural conditions so that they can be aided and directed toward bee improvement, are the following :-

1. Careful selection of the breeding stock with special reference to those qualities that it is desirable to perpetuate and add to.

2. Selection of drones from the most vigorous queens whose worker progeny are noted for size, strength and honey-gathering capacity.

A rigid system of pruning cells and killing defective queens.

How far this improvement can be carried with the bee is difficult to determine, as the organs of reproduction in the queen, as well as her fertilization, are so unlike the breeding of our domestic animals that the queen breeder will always have immense difficulties to contend with. W. F. GEDDES. Wellington Co., Ont.

HORTICULTURE.

Spraying Ten Acres of Apples.

Editor "The Farmer's Advocate": I figure that an orchard of ten acres would probably contain on an average of 400 trees. I figure on the labor of three men to operate a power outfit, two men to handle the spraying rod; one on the tank and one on the ground, and one to drive the horses. I figure two men at \$1.50 per day, \$3.00, and a team and man at \$4.50-that may be a little high, but that is what we have to pay in our county-making a total

arsenate of lead .7 cents, making a total of 2.03 cents per gallon spraying mixture. At 5 gallons per tree that will make the second spraying cost 10.15 cents per tree.

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As to the third spraying which, in my opinion, should follow 10 days or two weeks after the sec-ond, it would take the same material and same labor and the same cost; so the the third spraying it would cost for 2.03 per gallon, and at 5 gallons to a tree, it would cost 10.15 cents per tree. The first spraying at 12.9, and the second and third sprayings at 10.15 cents per tree, make a total of 33.2 cents per tree for three thorough sprayings. Therefore, 400 trees would cost \$132.80. At 4 gallons per tree it would reduce the cost one-fifth, making a total of 26.56 cents per tree, or a total cost for 400 trees of \$106.24 . If you eliminate the third spraying, which is not necessary in all seasons, and I have seen excellent results with two sprayings, and taking 5 gallons to a tree, it would cost 23.05 cents per tree, \$92.20 for two thorough sprayings; or or for two sprayings at 4 gallons to a tree, would cost 18.44 cents per tree, or \$73.76 for the 400 trees in a ten-acre orchard.

I use 150-gallon tank and gasoline engine. 1 prefer a 150-gallon tank to a 200-gallon tank. In one of the orchards it is very hilly, and I find no trouble in getting around with a 150-gallon tank. I do not believe in horse-power for spraying trees. I do not think it is practicable. You can only generate power when your wheels are in motion; I prefer gasoline engines to hand outfits for several reasons. I think first that they are far cheaper to operate. You can operate a gaso-line engine for 10 or 15 cents a day for pasoline, and you can get a higher and more even I prefer a pressure of over 150 lbs. I pressure. have experimented this past season on different pressures, and I found that I got much better results from a pressure of 150 to 200 lbs., an average of 175 lbs.; as I say, high pressure is more economical in spraving. You can get where you want to more quickly, and you do not waste so much material. I think that high pressure is

ott rarm,

very essential for the second spraying after the blossoms have come out. You cannot drive the spraying material into the calyx end of the blosthe som with a 60 or 70 Ibs. pressure. I find it can be done better with a 150 or 200 ibs., or an average of 175, and high pressure for blossom suraving in my opinion is very important, and much better results can be obtained with high pressure at that time than any other.

I would buy a pump that would give that pressure. nie Some pumps will not, the capacity is not sufficient. You want a pump that will give vou sufficient pressure

medical man, is known locally as Buttermilk Doctor," who pre-scribes this homely remedy for many

affiict his patients, and se who are afflicted with what olic disease. He claims to be worst case of alcoholism by a uttermilk to take the place of hisky and beer. More Butterwould be a decided advantage -called civilized nations. We are cal at the present time about rong drink among the working le permanent good will be l a satisfactory substitute is of whisky and beer the human cases, is like the lower animals and water-they become crazed. if buttermilk is the substitute g for. Instead of feeding this ng it, as is the case at some ne will in future undertake to wholesome quantities and have , restaurants, etc., as is the h other forms of beverages. We nany of the bars in New York re list buttermilk among their thousands of glasses are sold ally during hot weather. This idvantage in that a man who ong drink, does not care for h with soda-waters of doubtful esires to be sociable can usk for ul buttermilk. Man is a social useless to try to break up ocial customs without a satis-. If, however, these social tilized for the good, instead of members of a social community

of whole milk. A few particles of butter allowed to float on top of the buttermilk will give added taste and please the customers. Producers can very well afford to lose a little butter in this way, if the price is high for the by-product.

Finally a buttermilk campaign might, and doubtless would, do a great deal of good in overcoming the ravages of strong drink among these addicted to the habit. "'More Buttermilk, Less Beer" for Canadians. 0. A. C.

H. H. DEAN.

THE APIARY.

The Rearing of Good Queens. Editor "The Farmer's Advocate"

The matter of rearing queens with a view to the improvement of our bees is certainly of no mean consideration to the beekeeper. In rearing queens it is necessary to study the conditions which exist when queens are reared naturally, namely—under "the swarming impulse." This swarming fever usually takes place under the most favorable circumstances. The colony is in the most prosperous condition; it is crowded with worker bees of every age; drones make the air resonant with their wings; both honey and pollen are coming in abundantly, and the atmosphere within the hive is maintained at an even temperature. The queen cells that are built are well developed because the bees know how to rear queens perfectly well.

Keeping in mind these natural conditions of a colony when building queen cells, the principles of queen rearing may be formulated into the following propositions :

1. The hive must be well filled with bees, and the bulk of them must be young ones.

One of the Females to be Sold by Auction of near London, Ont., on September 15, 1915.

cost of \$7.50 a day for help. Now, the capacity of a power outfit should be about 1,500 gal.ons. Some days we would run more than that, and some days less. That would give us a cost per gallon of one-half a cent.

Regarding the material, I wish to give you the result of the material I use. For my first spraying I use the commercial lime-sulphur for scale or aphis or fungus. I use it at the strength of 1 to 11, and try to use it just before the buds are opening. As to the average price of commercial lime and sulphur, I figure it at \$10.00 a barrel of 40 gailons, and one barrel diluted at 1 to 11 would ma e 480 gallons of spraying mixture, which would make a cost of 2.08 cents per spraying gallon. Now, at cost of labor of .5 and cost of material at 2.08, would make a total of 2.58 cents per gallon. I figure on an ordin-ary-sized tree 5 gallons to a tree-some trees will ta e less and some a little more, but I believe by judgment and care 5 gallons can be made to do the work. At 5 gallons to a tree, and 2.58 cents per gallon would make it cost 12.9 cents per tree for the first spraying. For the second spraying, for codling moth principally, and fungus, which I give just as the blossoms have fallen, I use commercial lime-sulphur at the same cost per barrel, but dilute it at 1 to 30, and that would make 1,240 gallons or a cost per gallon of .83 cents. I add with that arsenate of lead, which I figure at an average of 14 cents a pound in small packages, it would probably cost less in larger packages. I figure 2 lbs. of arsenate of lead to 40 gallons of water, or 5 lbs. to 100 gallons, making the arsenate of lead cost .7 cents per gallon. The labor will cost you just the same for your second and third spraying. The lime and sulphur would cost .83 cents and the

and capacity for the kind of nozzles which you propose to use. I like a pump that will carry at least four large nozzles, two for each line of hose. I have in my work discarded the small nozzles alogether. I use a nozzle of the Friend type, of which there are a dozen different makes, and I find that I have less trouble and better results.

I think the question of hose is the most important. It is absolutely necessary that you get good hose. More time and money can be lost good hose. with poor hose than with any other part of the outfit, that part generally breaks down first. I would always buy a good hose fitted with large plugs and clamps. A good many of the hose plugs that are sold have only one. Have them made with long shanks so that you can put two clamps on them. I have quite a lot of trouble with those single-clamp hose plugs. I used on one outfit this year four different lots of hose before I got a good hose. I would sooner pay 50 cents a foot for good hose than pay 5 cents a foot for inferior hose, as I would save it in loss of time. I think it pays nearly every time to buy the best you can.

I recommend gasoline engines for another reason. They are always useful to a man on the They can be easily attached to other farm. things, generally by undoing three or four bolts, and they can do lots of little things on the farm. When I was through with my spraying I took the engine to my home and attached it to a little pump which I have there, and it is now supplying water for the entire farm. They do not need much looking after by anyone who can follow the instructions given and avoid trouble. There is an old saying that if you spare the rod you will spoil the child; I think that if you spare the material you will spoil the fruit every time.