

reasonably sweet, and reasonably clean in flavor. The body shall be reasonably firm, but may be somewhat defective in grain or texture. The color may be either light, medium, or high and may show considerable waviness, but must be free from mottles. The salt may be either light, medium, or high and somewhat gritty, but must be fairly uniform. The package shall be uniform and sound.

"7. Butter scoring 88 shall be 'good', but may show any objectionable flavor. It must not show garlic, rank weedy, or off flavors. The body must be reasonably firm, but may be somewhat defective in grain or texture. The color may be either light, medium, or high and may be slightly mottled. The salt may be either light, medium, or high and may be somewhat gritty and irregular. The package must be uniform and sound.

"8. Butter scoring 87 shall be reasonably 'good', but may show foreign, unclean, or off flavors except that it must not show any rancid or strong flavor. The body may be weak and defective in grain or texture, but must draw a full trier. The color may be somewhat irregular and may be mottled. The salt may be irregular and gritty. The package must be uniform and sound.

"9. Butter scoring 86 may show very distinctly any foreign, unclean, or off flavor except that it must not show any rancid or strong flavor. The body may be weak and otherwise defective, but must be solid boring. The color may be irregular, streaked, or mottled. The salt may be irregular or extremely high. The package must be uniform and sound.

"10. Butter scoring 85 may show a pronounced foreign, unclean, or off flavor, except that it must not show any rancid or strong flavor. The body may be weak and otherwise defective, but must be fairly solid boring. The color may be irregular, streaked, or mottled. The salt may be irregular or extremely high. The package must be uniform and sound.

"11. Butter scoring 84-83 may show a very pronounced foreign, unclean, or off flavor, except that it may be only slightly rancid or strong on tops and sides. The body may be weak and ragged boring. The color may be extremely high, streaked, or mottled. The salt may be extremely high and irregular. The package must be uniform and sound.

"12. Butter scoring 82-80 may be rancid or strong on tops and sides. The body may be ragged boring. The color may be irregular, extremely high, streaked, or mottled. The salt may be extremely high and irregular. The package must be sound.

"13. Butter containing defects of a more marked degree than previously specified shall be given a score below 80, depending upon the extent of the defects.

"14. Butter which would score below 75 shall be classified as Grease Butter."

Relative Prices For Dairy Products.

A very interesting and valuable circular has been published recently by the Department of Agriculture at Ottawa. This circular, which has been contributed by the Dairy Commissioner's Branch, deals with the yield and relative value of some dairy products. We are first told that using milk containing 3.5 per cent. of fat and 12.5 per cent. of total milk solids as a basis, 100 lbs. of such milk would produce the following quantities of various dairy products and their by-products: Cheese, 9.30 lbs. and 90 lbs. of whey; butter, 4.20 lbs. and 90 lbs. of skim-milk; unsweetened evaporated milk 39.68 lbs.; sweetened condensed milk, 39.68 lbs.; milk powder, 12.75 lbs.; cream powder, 4.77 lbs., and 7.62 lbs. of skim-milk powder, 8.23 lbs. and butter 4.20 lbs. The accompanying table is given to show the approximate yield of Canadian Cheddar cheese and butter from 100 lbs. of milk containing different percentages of fat.

Per Cent. of Fat in Milk	Pounds of Cheese from 100 pounds of Milk	Pounds of Butter from 100 pounds of Milk
3.0	8.52	3.60
3.1	8.73	3.72
3.2	9.02	3.84
3.3	9.14	3.96
3.4	9.21	4.08
3.5	9.30	4.20
3.6	9.39	4.32
3.7	9.50	4.44
3.8	9.72	4.56
3.9	9.90	4.68
4.0	10.08	4.80

We are also told that one pound of fat produces 2.65 lbs. cheese and 1.20 lbs. butter; that 100 lbs. of 3.5 per cent. milk produces 9.30 lbs. cheese and 4.20 lbs. of butter, and that the cost of making a pound of cheese is 2¼ cents, and the cost of making a pound of butter is 4 cents. These figures as to cost will, of course, vary, but taking the above figures with regard to yields and costs as a basis, a very interesting and instructive table is given, showing the prices which must be obtained for cheese and butter to give the same net return for 100 lbs. of milk testing 3.5 per cent. of fat, or for one pound of fat, or for one pound of "fat and casein" (fat plus 2). This table in the circular gives the equivalent for each quarter cent increase in the price of cheese, but we are reproducing herewith only the figures showing the equivalent for increases of one-half cent per pound in each case. Producers will find this table very handy for reference purposes.

(1) Price of Cheese	(2) Net Return for 100 Pounds Milk	(3) Equivalent Price of Butter	(4) Net Return for 1 Pound Pound Fat	(5) Net Return for 1 Pound "Fat and Casein." (Fat+2)
Cts.	\$	Cts.	Cts.	Cts.
12.00	0.91	25.75	26.00	16.54
12.50	0.95	26.75	27.14	17.27
13.00	1.00	27.75	28.57	18.18
13.50	1.05	29.00	30.00	19.09
14.00	1.09	30.00	31.14	19.81
14.50	1.14	31.25	32.57	20.72
15.00	1.19	32.25	34.00	21.63
15.50	1.23	33.25	35.14	22.36
16.00	1.28	34.50	36.57	23.27
16.50	1.33	35.75	38.00	24.18
17.00	1.37	36.75	39.14	24.90
17.50	1.42	37.75	40.57	25.81
18.00	1.47	39.00	42.00	26.72
18.50	1.51	40.00	43.14	27.45
19.00	1.56	41.25	44.57	28.36
19.50	1.60	42.25	45.71	29.09
20.00	1.65	43.25	47.14	30.00
20.50	1.70	44.50	48.57	30.90
21.00	1.74	45.50	49.71	31.63
21.50	1.79	46.50	51.14	32.54
22.00	1.84	47.75	52.57	33.45
22.50	1.88	48.75	53.71	34.18
23.00	1.93	50.00	55.14	35.09
23.50	1.98	51.25	56.57	36.00
24.00	2.02	52.00	57.71	36.72
24.50	2.07	53.25	59.14	37.63
25.00	2.12	54.50	60.57	38.54
25.50	2.16	55.50	61.71	39.27
26.00	2.21	56.75	63.14	40.18
26.50	2.26	57.75	64.57	41.09
27.00	2.30	58.75	65.71	41.81
27.50	2.35	60.00	67.14	42.72
28.00	2.40	61.25	68.57	43.63
28.50	2.44	62.00	69.71	44.36
29.00	2.49	62.25	71.14	45.27
29.50	2.54	64.50	72.57	46.18
30.00	2.58	65.50	73.71	46.90
30.50	2.63	66.75	75.14	47.81
31.00	2.68	67.75	76.57	48.72
31.50	2.72	68.75	77.71	49.45
32.00	2.77	70.00	79.14	50.36

Commenting on these tables, the circular explains them and their use very simply. We cannot commend too strongly the consideration of these figures. We believe that the Dairy Branch has done a really good piece of work when they worked out into practical form comparative figures as to yields of different dairy products per 100 pounds of standard milk. Producers should be fully acquainted with the equivalent prices that should be received for milk employed for different purposes, and information of this kind is of a nature most essential for this purpose. We quote the following explanatory notes with regard to the large table:

"If 100 pounds of milk testing 3.5 per cent. of fat produces 9.3 pounds of cheese, which is sold at the prices indicated in column 1, with a manufacturing charge of 2¼ cents per pound of cheese deducted, and the value of the whey not taken into consideration,—

"Column 2 shows the net return for 100 pounds of milk; column 3 shows the net return for 1 pound of fat; column 4 shows the net return for one pound of 'fat and casein,' if the proceeds are divided according to the 'Fat+2' method.

"If 100 pounds of milk testing 3.5 per cent. of fat produces 4.2 pounds of butter, for which a manufacturing charge of 4 cents per pound is deducted, and the value of the skim-milk is not taken into consideration,—

"Column 3 shows the price at which the butter must be sold to realize the same net return for 100 pounds of milk or per pound of fat or per pound of 'fat and casein' as is shown in columns 2, 4 and 5, respectively.

"If a producer knows what net price he can realize for 100 pounds of milk or for one pound of 'fat and casein,' as the case may be, this net return may be located in column 3 or column 5, and the same line in column 4 will indicate the net price which must be obtained for 1 pound of fat to equalize the price being obtained by either of the other two methods.

"The value of the by-products (whey and skim-milk) varies, since at times it is impossible for the producer to feed all of the by-products, and since their value depends also on the probable market value of the stock to which they are fed. Consequently, the value of the by-products is not taken into consideration in table 3. Each producer may estimate the value of the by-products in his own particular case and add the estimated value of the by-products to the value of the milk as shown in this table. Table 1 shows the pounds of by-products from 100 pounds of milk.

"In order to ascertain the net return of milk testing other than 3.5 per cent. of fat, the net value per pound of the cheese or butter must be determined by subtracting the cost per pound of manufacturing from the selling value per pound of the product. This net price per pound, multiplied by the yield of the product per 100 pounds of milk as shown in table 2 will give the net return for 100 pounds of milk. The net return for 100 pounds of milk divided by the per cent. of fat in the milk will give the return for one pound of fat.

"For example:—If milk tests 3.8 per cent. of fat while cheese sells for 24½ cents per pound and the cost of manufacturing is 2¼ cents per pound, the net value to the producer of 1 pound of cheese is 24½ cents—

2¼ cents = 22½ cents. Referring to table 2, 100 pounds of milk testing 3.8 per cent. of fat will produce approximately 9.72 pounds of cheese. Therefore, the net return of 100 pounds of milk is 9.72 x 22½ cents = \$2.16. The net return for 1 pound of fat is determined by dividing \$2.16 by 3.8, which gives 56.84 cents. The value of the same milk manufactured into butter may be determined in a similar way if the market value of butter is known. If the cost of manufacturing differs from the figures used in the table, the correct figures may be substituted."

POULTRY.

Constitution and Vigor Necessary.

Constitution and vigor are factors in the successful raising of poultry that are indispensable. These two factors imply all that is meant by health, vitality and activity. Constitutional vigor is one of three factors of primary importance in the selection of foundation stock for any successful flock, the other two factors being size and egg production.

Of late years we have come to expect a great deal more of the modern hen than formerly. The barnyard hen of a few years ago is fast being lost sight of, and in her place has come an economical producer of human food that is rapidly being given a definite place on hundreds of farms throughout the country. Formerly the hens were looked after by the women and children, the money received for eggs going for various purposes incidental to life on the farm. The farm flock of to-day occupied an entirely different place. During the years of the war feed and labor were very costly with the result that any kind of live stock that helped to use up either feed or labor had to pay for itself or be eliminated. Moreover, those who have been investigating poultry problems and studying the question of egg production have made very rapid strides, so that the knowledge we now possess is much greater than it was a few years ago. If we examine a hen now during the summer months of June, July and August we can, if we have taken the pains to find out how, tell approximately whether that hen is a profitable or unprofitable member of the flock. We know that hens respond to cleanliness, variety in feed, quantity of feed, just as other live stock do, and all this means that we have made the hen work harder, or are continually trying to do so. Everyone knows that the harder we work, and the longer we keep at it, the more vigor and constitution we must have in order to stand up under it. Constitution and vigor, therefore, have become increasingly important factors in poultry raising for the simple reason that we expect the modern hen to lay more eggs than her predecessors did.

Fowls often break down from over-production, and the next or succeeding generation show a loss of vitality as a direct result of this. We expect that a good hen will produce within one year from three to five times the weight of her body in eggs, but the average hen probably lays only a few more eggs than would equal the weight of her body. If a hen were to lay an egg every three days throughout the whole year, authorities have stated that she must consume about thirty times her body weight of feed. This indicates to a certain extent what is expected of the modern hen. Much of the low fertility and hatchability in poultry, and much of the weakness and mortality in young chicks, can be traced to the lack of the necessary vigor and constitutional strength in their ancestors. All flocks show birds that are weak as well as those that are strong in vigor. Breeding and selection should be carefully carried out that the weak ones are eliminated and the percentage of strong-constituted birds increased. In-breeding is often resorted to by breeders in order to fix the desirable qualities of a breed, but, where this done, the greatest care and attention must be given to the vigor and constitution of the birds that are so bred, because no matter how firmly the characteristics of high egg production are fixed by skilful breeding, nothing whatever will have been gained unless the birds so bred possess strength and vitality, and can impart it to their offspring. Lewis, in his book on "Productive Poultry Husbandry," gives a number of things which cause loss or lack of vigor, as well as a few paragraphs indicating certain signs of high vitality. These points are given very briefly and well, so that they are quoted herewith as follows:

"The use of pullets instead of hens for breeding will lower vigor by producing progeny from immature parents. Under normal conditions the fowl is allowed a part of the year in which to rest and store up energy for future seasons of heavy production, and it will be found that forced feeding and heavy production are antagonistic to the highest fertility and greatest degree of vigor in the offspring. It is well, therefore, at as early a date as possible, to pick out all the adults which are desirable for use as breeders, and give them time to store up energy and physical strength. The modern intensive system of handling poultry is responsible for much of the present low vitality. Where it is desirable to raise future economic producers it should be the policy to handle the breeding fowls on extensive farms rather than on intensive producing poultry plants. Both young stock and breeders have more vigor when raised on land used for other purposes, as fruit growing, grass, and grain crops that are being raised mostly for pasture and green forage. Lack of exercise for breeding stock is another direct cause of low fertility and subsequent low vitality. Carelessness and improper methods of hatching and rearing chicks give bad results. Failure to select breeding stock with