USDA-DHIA MILK COMPONENTS SIRE SUMMARY

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Abstract

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Sire summaries for protein and solids-not-fat have recently been made available to the dairy industry and explanatory material is necessary. The first article presented here includes justification for the calculation of these summaries and a general explanation of the calculation and proper use of the summaries. The second article details statistical procedures used in calculation and draws parallels to the current system for milk and fat evaluation (the Modified Contemporary Comparison). Limitations of the data are explained as are the calculations of Predicted Differences for protein and solids-not-fat percentages. Previous work established the need to standardize protein and solids-not-fat data for age and month of calving. The development and implementation of appropriate factors are in the third article. Finally, procedures for developing a single economic index, including sire evaluations for milk, fat, and protein or solids-not-fat, appear in the last article. An example of index development is in the appendix.

KEYWORDS: Protein, solids-not-fat, milk components, sire evaluations, genetic improvements, milk pricing.

Preface

Publication of the first "USDA-DHIA Milk Components Sire Summary" was the culmination of months of research and development work by USDA-ARS scientists and support personnel. The summary utilized mixed model sire summary procedures developed jointly with researchers at Cornell University between 1972 and 1974.

New techniques in the "USDA-DHIA Milk Components Sire Summary" are described in the following four articles:

(1) "An Introduction to Protein and Solids-Not-Fat Sire Summaries."—Provides an overview of the milk components sire summary system, including a discussion of the situation in the dairy industry that made genetic evaluation for protein and solids-not-fat desirable. A general explanation of the calculation of Predicted Differences (PD's) for components is provided.

(2) "The USDA-DHIA Sire Evaluation Procedure for Protein and Solids-Not-Fat."—Describes in detail the techniques employed in Mixed Model Comparison.

(3) "Factors for Standardizing 305-Day Protein and Solids-Not-Fat Records for Age and Month of Calving."—Explains the development and utilization of age and month-of-calving factors for standardizing protein and solids-not-fat lactation records in genetic evaluations.

(4) "An Economic Index for Use in Selecting Bulls Evaluated on Protein or Solids-Not-Fat."—Describes the background underlying the calculations of an economic index when protein or solids-not-fat components are included.

Calculation of milk component sire summaries differs in several ways from that of Modified Contemporary Comparison (MCC) sire summaries for milk and fat. This publication is intended to aid educators, students, industry personnel, and dairymen in understanding milk component sire summary procedures. It provides the necessary background to properly interpret the USDA-DHIA milk component sire summaries for use in genetic improvement.

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USDA-DHIA MILK COMPONENTS SIRE SUMMARY

By H. D. Norman, B. G. Cassell, F. N. Dickinson, and A. L. Kuck[1]

An Introduction to Protein and Solids-Not-Fat Sire Summaries

H. D. Norman, B. G. Cassell, and F. N. Dickinson

Reason for developing milk component sire summaries.—Component milk pricing is an increasingly vital issue in today's dairy industry as evidenced by several developments.

(1) There is great concern in the United States about the continued drop in milk consumption per capita. From 1942 to 1974, whole milk equivalent per person dropped from 736 to 543 pounds and butter from 15.0 to 4.3 pounds—a decrease of 73 percent—whereas cheese consumption per capita rose from 6.4 in 1942 to 18.8 pounds in 1974—an increase of 293 percent. Sales of skimmed and low fat milk increased from 1964 through 1974 by 149 percent while whole milk sales dropped.

(2) Dairymen wish to reverse the trend in total milk sales. With the present minimum standards and consumer demand for low milk fat content, the concern centers on the fact that too much milk offered consumers has less flavor and is low in nutrients. The national standards of 8.25 percent solids-not-fat (SNF) and 3.25 percent fat (14) [2] are considered low by many. Minimum whole milk percentages have been increased in recent years in California and are now 8.8 percent SNF and 3.4 percent fat, and as a result per capita consumption has risen.

(3) The market value of protein compared with that of fat has increased dramatically over the past few years. This increase is reflected in the USDA purchase price of nonfat dry milk. The price ratio of dry milk to butter was 0.24:1 in April 1965 but climbed to 0.66:1 in October 1978 (13).

(4) Several milk processors in various parts of the country have begun paying a differential for protein produced or paying a premium for milk surpassing a specified minimum percentage of protein.

(5) Artificial insemination (AI) organizations recently have taken steps to obtain information on milk components. One organization is paying for protein records completed through the National Cooperative Dairy Herd Improvement Program (NCDHIP) on daughters of their bulls (1). Another has calculated sire summaries for percentage and yield of SNF (4).

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[2] Underlined numbers in parentheses refer to Literature Cited at the end of this report.

(6) In the past, most dairymen have had little incentive for improving protein and SNF because they were not paid for these components. However, dairymen in California have been paid for quantity of SNF since 1962. Because of this payment, they have collected a large volume of SNF lactation data in that State. Newly introduced electronic techniques have made testing for protein more accurate and economical than ever before. It is now feasible to test all cows enrolled in the NCDHIP for protein or SNF.

USDA sire summaries for protein and SNF have been developed to enable dairymen to respond to the shift in value of protein and SNF relative to fat. These summaries will enable them to increase the economic benefit from sire selection under component pricing systems.

Who needs milk component sire summaries?--Each breeder will have to decide the extent to which protein and SNF sire summaries are useful in his own situation. Uncertainty about milk pricing methods in the future may limit the usefulness of these summaries for many dairymen. Those not now being paid for these components may choose to ignore them. On the contrary, dairymen who are presently being paid for milk components other than fat or who anticipate such a payment within 5 years should be advised to consider the new Predicted Difference (PD) dollars for protein and SNF. Byproduct milk markets are interested in obtaining milk that is high in milk solids as it produces higher yields of cheese, butter, and other milk products. Furthermore, the market is considering raising the minimum standards in order to sell consumers a tasty product of good quality. It should be remembered that milk is produced for consumption and unless there is a market for it, volume will have no value. Until 10 years ago, fat represented two-thirds of the value of milk. Today, fat carries one-third of the price; the other two-thirds is based on volume. If either the percentage of milk processors who pay for protein or SNF increases or the minimum standards for these components change, then bulls siring higher percentages of protein and SNF would be in heavy demand throughout the United States.

How to use and interpret milk component sire summaries.--It is important that selection by the producer should be for the high dollar values and not for high percentage of protein or SNF. Selection for bulls with high PD dollars will result in maximum economic gain under component pricing situations. A selection scheme strictly for high percentage of protein or SNF is certain to result in reduced income from the sale of milk because of the negative relationship that exists between milk yield and component percentages. Only in extreme circumstances could a dairyman justify putting substantial emphasis strictly on percentages of protein or SNF. One such circumstance would be when a minimum percentage must be met and a herd is below the minimum level. Even then, more drastic measures, such as buying and selling cows to raise herd level of components, would be needed. Any service sires selected would not have daughters milking for approximately 3 years. Even then daughters of high-component bulls would represent only a small percentage of the herd. Dairymen can justify secondary consideration of the percentage of protein and SNF in individual matings (similar to what many do presently for fat percentage), if they first selected the bulls for high PD milk or PD dollars.

For many genetically superior bulls, milk component data are not available at this time. Therefore if a dairyman decides that component summaries should be considered in his breeding program, he faces the problem of selecting among bulls with and without component evaluations. Suppose bull A has a protein summary giving him a PD dollars of +100. For bull B with no protein summary, a milk and fat summary shows PD dollars of

+150. A dairyman should select bull B with the higher dollar value if he wants to maximize his dollar return from milk sales, even though for bull B there is no component summary. Clearly, dairymen should not restrict themselves to bulls on the USDA-DHIA milk components sire summary list. Such a practice would put them at a severe disadvantage compared to the alternative of selecting the high PD dollar bulls from the active AI list and the complete sire summary list. Instead, the component sire summary list should be considered a supplement to the regular list, designed to fit the needs of a component payment situation by utilizing the component information that is available.

Dairymen should keep in mind that some of the component summaries are based on samples of daughters radically different from daughters in the milk and fat summaries. Most of the SNF data are from herds in California and most of the early protein data from herds in Pennsylvania. Some of the data are old and subject to possible variations in the accuracy of early component testing procedures.

The file of records available for component evaluations should increase as interest in component testing develops. The accuracy of component sire evaluations can be expected to increase at the same time. Dairymen should be cautioned about placing too much emphasis on component summaries with low Repeatabilities because of possible sampling problems. Like the PD's for milk and fat, the PD for components cannot be expected to remain exactly the same as new daughters are added to the summaries. Many bulls with low Repeatabilities will change substantially, but bulls with high Repeatabilities should remain relatively stable. A low Repeatability bull showing a $3 advantage under a protein pricing system on his current summary could easily show a $3 disadvantage on a future summary, just the same as a low Repeatability bull may change from +300 to -300 pounds in PD milk.

Different samples of daughters in the protein and SNF data files have caused an unusual situation to develop for the bulls with component summaries for both protein and SNF. A few of these bulls may show an increase in PD dollars when SNF is considered over the PD dollars based on just milk and fat, yet a decrease in PD dollars when protein is considered, or vice versa. Genetic relationships between protein, SNF, and fat indicate that such situations are not expected very often if the PD's for milk, fat, protein, and SNF are based on the same daughters. Most likely, one or the other of the component summaries contains a sample of a bull's daughters unrepresentative of what might be expected in the future. In such a situation, both component summaries should be considered along with the Repeatability of each, because the two component summaries are based on different daughters.

Prices used in the milk component sire summaries.—Each year since 1971, the average price for all milk sold to plants and the Chicago Grade A wholesale butter price have been used to calculate PD dollars for bulls and Cow Index dollars for cows (10). Values for 1978 were $10.40 per hundredweight for milk and 12.8 cents per 0.1 percent fat per hundredweight about a fat base of 3.5 percent (13). The average price of nonfat dry milk for 1977 was estimated to be 71 cents per pound. Therefore a differential of 6.6 cents per 0.1 percent SNF per hundredweight of milk (allowing for a 5-cents-per-pound processing cost) was used for SNF payment about a SNF base of 8.5 percent. A differential of 9.4 cents per 0.1 percent protein per hundredweight of milk was used for protein payment about a protein base of 3.2 percent. A higher differential for the protein summaries seemed desirable for three reasons: Protein is the most valuable portion of SNF for cheese production; our summaries show that as SNF yield increases 1 pound, protein yield increases considerably less than a pound; and the ratio of the differentials used for protein and SNF produces approximately the same dollar distribution for protein and SNF, thus allowing more interchange of the protein and SNF evaluations. Thus dairymen receiving payment for protein can select confidently among bulls with high PD dollars based on fat-SNF pricing and vice versa.

Using these values, the following formulas were applied to calculate PD dollars from the values first given for components. All estimates of PD milk, fat, protein, and SNF were obtained from the lactation records containing either protein or SNF component data.

PD dollars for fat = \$0.0592 (PD milk) + \$1.28 (PD fat) Eq. 1

PD dollars for protein = \$0.02912 (PD milk) + \$1.28 (PD fat) + \$0.94 (PD protein) Eq. 2

PD dollars for SNF = \$0.0031 (PD milk) + \$1.28 (PD fat) + \$0.66 (PD SNF) Eq. 3

The component differential will be updated each year as the relative values of the components change.

Characteristics of milk component sire summaries.—Table 1 summarizes the number of bulls evaluated by breed for protein and SNF along with the range of changes in PD dollars.

Table 1.—Number of bulls by breed from fall 1977 USDA-DHIA milk components sire summary with protein and solids-not-fat summaries and change in PD dollars

Change in PD dollars	Number of bulls by breed with indicated summary									
	Ayrshire		Guernsey		Holstein		Jersey		Brown Swiss	
	Protein	SNF	Protein	SNF	Protein	SNF	Protein	SNF	Protein	SNF
+11 to +15—	0	0	0	0	1	19	1	0	1	0
+6 to +10—	0	0	1	1	8	66	2	3	1	1
0 to +5—	5	6	9	19	29	241	11	19	2	12
-5 to -1—	5	2	8	13	27	230	8	19	3	10
-10 to -6—	1	0	4	4	10	118	1	3	2	4
-15 to -11—	0	0	0	0	13	43	0	0	2	0
-20 to -16—	0	0	0	0	0	13	1	0	0	0
Total——	11	8	22	37	88	730	24	44	11	27

For protein, the changes are the differences between PD dollars calculated from milk, fat, and protein (equation 2) and PD dollars calculated from only milk and fat (equation 1) from the protein records. For SNF, the changes are the differences between PD dollars calculated from milk, fat, and SNF (equation 3) and PD dollars calculated from only milk and fat (equation 1) from the SNF records.

PD dollar estimates including components are closely tied to PD dollars for milk and fat from the Modified Contemporary Comparison (MCC). A change in PD dollars previously explained was added to the MCC PD dollars for each bull to obtain the estimate of PD dollars published for each component. Thus each value for PD dollars for a component is a revision of MCC PD dollars for milk and fat based on the best knowledge available of a sire's transmitting ability for protein or SNF.

This information is intended to introduce users to the new milk component sire summaries. We have not attempted to explain in detail all the procedures used to develop these sire evaluations. However, this information on component summaries should be sufficient to direct dairymen in the proper use of this new breeding guide.

The USDA-DHIA Sire Evaluation Procedure for Protein and Solids-Not-Fat

H. D. Norman and B. G. Cassell

Description of the procedure.--Dairy cattle breeders have many resources to help in making genetic improvement. The implementation of the Modified Contemporary Comparison (MCC) (6) in the fall of 1974 greatly improved the accuracy of the sire summaries for milk and fat. A part of the gain in accuracy of these evaluations was accomplished by improved weighing across daughter records and including adjustments for the genetic level of the herd. These improvements caused substantial changes in many individual sire Predicted Differences (PD's) from the previous herdmate comparison evaluations. More accurate selection from the use of the MCC summaries should result in increased yield of daughters first freshening in 1978.

The Mixed Model Comparison used in the calculation of protein and solids-not-fat (SNF) sire summaries has many of these same advantages, requires less computer cost for small data sets than does MCC, and is more precisely defined statistically. Estimates of bulls' genetic transmitting abilities for yields are calculated by solving large numbers of equations for effects, including herd-year-season, sire groups, and individual sires. Those familiar with solving multiple equations simultaneously with techniques learned in an algebra course can consider each sire summary run as the assembly of all pertinent information into equations followed by the calculation of appropriate solutions for each bull.

Techniques similar to those in the Mixed Model Comparison have been used in research for many years, and improvements in computer speed and recent innovations in computer program development have made the approach operationally feasible for sire evaluations in some situations. Similar techniques have been used at Cornell University since 1970 to evaluate artificial insemination (AI) sires for milk and fat based on first lactation records (7). The mixed model methodology using first lactations on both AI sired and non-AI sired cows is being used in Canada (3).

PD's for pounds of protein and SNF are calculated using computer programs developed through a cooperative research effort between the U.S. Department of Agriculture and Cornell University during 1972-74 (5). [3] This Mixed Model Comparison is similar to MCC in many respects in that both procedures (1) eliminate the need to assume that bulls were mated at random with regard to other bulls (the merits of the herdmates' sires are not assumed to be equal for all cows), (2) utilize the fact that bulls selected are not from a single genetic population, (3) summarize both AI and natural service bulls, (4) use multiple records on daughters, and (5) account for the intraherd correlation among a bull's daughters.

The model equation used is as follows:

$$y_{ijklm} = ht_{ij} + g_k + s_{kl} + hs_{ikl} + c_{iklm} + e_{ijklm}$$

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[3] Ufford, G. R. Dairy sire evaluation using all lactation records in best linear unbiased prediction procedures. 1976. [Unpublished Ph. D. thesis. Copy on file Dept. Anim. Sci., Cornell Univ., Ithaca, N.Y.]

where:

y_{ijklm} is the milk, fat, protein, or SNF yield of the mth daughter by the lth sire in the kth genetic group in the jth year-season and ith herd.

ht_{ij} is a fixed effect common to all observations in the jth year-season in the ith herd; with seasons defined as January to June and July to December.

g_k is a fixed effect common to daughters of sires in the kth genetic group.

s_{kl} is a random effect common to daughters of the lth sire in the kth genetic group.

hs_{ikl} is a random effect common to daughters of the lth sire in the kth genetic group in the ith herd.

c_{iklm} is a random cow effect of the mth daughter of the lth sire in the kth genetic group in the ith herd.

e_{ijklm} is the unexplained variation associated with the mth daughter of the lth sire in the kth genetic group that appears in the ith herd and jth year-season.

The relative variances of random effects are assumed to be the same as in MCC:

Sire variance	0.05
Herd x sire variance (c^2)	.14
Cow variance	.31
Error variance	.50

Some details of the program structure of this mixed model system were given by Dickinson et al. (5). Note this is also the same model equation used in the MCC (9) except that genetic groups (G_f) are included directly. In MCC, sires are treated as fixed effects in deriving bull differences, then are considered random effects and regressed toward fixed group means.

The evaluations for protein and SNF are dependent on the present MCC sire summaries for milk and fat in three important ways. First, the genetic grouping of bulls is determined by combining bulls with similar pedigree indexes from MCC results. The pedigree indexes are based on the most recent MCC PD's for milk for the sire and the maternal grandsire. Second, the common base used in each successive run for protein or SNF is calculated using selection index theory and information on MCC PD's for milk and fat. The first step in calculating the base is to predict a PD for protein or SNF by selection index theory using only MCC PD's for milk and fat on each bull. Then, the actual PD's for protein or SNF for bulls with daughters that have protein or SNF data are forced to average the same as the selection index predictions on the same bulls. Therefore the base used for protein or SNF summaries will be consistent with the base for milk and fat. Third, the value of transmitting ability (estimation of PD dollars) is determined not only from the daughters with protein or SNF data but also from all daughters with information on milk and fat. Additional information on the calculation of PD dollars from protein and SNF is given in the last article.

Limitations on records included.--Every record with protein or SNF yield also has milk and fat information. Since the reverse is not true, PD's for milk and fat will have higher Repeatabilities than for protein or SNF.

Records in progress (RIP) were used but only if they were at least 80 days in length. Projection factors for fat were used to project the protein and SNF data in RIP's and incomplete records to a 305-day basis (8). If a cow had protein or SNF data from more than one herd, only the data from the first herd in which she was milked were used. That is, if a cow tested for either trait is sold to another herd testing for that same trait, records from the second herd were not used. Otherwise, that cow would have been considered to be two different daughters of the bull. The inability to properly account for cows changing herds is a disadvantage of the Mixed Model Comparison that needs to be overcome.

The limits imposed on protein percentages in lactation records included in sire evaluation are given by breed as follows:

Breed	Lower limit (percent)	Upper limit (percent)
Ayrshire	2.95	3.95
Brown Swiss	3.00	4.35
Guernsey	3.10	4.45
Holstein	2.75	3.90
Jersey	3.35	4.70

Limits were included to eliminate potential problems if a regional dairy records processing center supplied records from a herd based on fewer days in milk for protein or SNF than for milk and fat on the same cow. Different days in milk for different components could result from herds enrolling in or cancelling protein or SNF testing while remaining on an official testing plan for milk and fat. The limits were designed to accept protein or SNF percentages that were between two standard deviations below the means and three standard deviations above (11). More restrictive limits below the mean were applied because of this potential problem. Probably these limits will be relaxed for future records with verification of the accuracy of incoming data. The limits for SNF percentage accepted as valid are as follows:

Breed	Lower limit (percent)	Upper limit (percent)
Ayrshire	7.70	10.00
Brown Swiss	8.20	10.30
Guernsey	8.10	10.70
Holstein	7.60	9.90
Jersey	8.10	11.30

Records are weighted for length of lactation.--Each lactation is weighted according to its length, based on the phenotypic correlation between 305-day records and records of fewer days in milk. The correlations used were the same as for milk and fat in MCC and were as follows (6):

Months in milk	2-year-old cows	3-year-old cows and over
1	0.72	0.60
2	.83	.74
3	.88	.82
4	.92	.86
5	.94	.91
6	.96	.93
7	.97	.96
8	.98	.98
9	.99	.99
10	1.00	1.00

Weighting for lactation length is done both for RIP's and for incomplete records of fewer than 305 days. The appropriate weighting for lactation length is achieved by inserting into the appropriate cells of the normal equations the sum of the length of lactation weights instead of the number of records for each effect in the model.

In the MCC, the following items were built into the procedure to provide more accuracy than was available in the herdmate comparison: (1) Number of herdmates for each daughter's record, (2) length of lactation for each herdmate, (3) number of sires represented in the herdmates, and (4) average Repeatability of the herdmates' sires. The Mixed Model Comparison accounts for these same variables.

PD protein and PD SNF percentages.—The measure of a bull's transmitting ability for protein or SNF percentage is the PD for protein or SNF percentage. Each is the expected average deviation of a bull's progeny from herdmates in breed average herds. Each is computed as follows:

$$\text{PD component percent} = \left[\frac{(\text{PD for component} + \text{breed average component})}{(\text{PD for milk} + \text{breed average milk})} - \frac{\text{breed average component}}{\text{breed average milk}}\right] \times 100$$

The breed averages used in calculating PD for component percentages are in table 1.

Table 1.—Breed average yields used in calculating PD percentages [1]

Breed	Milk	Fat	Protein	SNF
	Pounds	Pounds	Pounds	Pounds
Ayrshire	10,538	416	351	897
Guernsey	9,291	439	333	842
Holstein	14,118	513	444	1,195
Jersey	8,794	444	337	826
Brown Swiss	11,852	478	413	1,063
Milking Shorthorn	9,238	340	296	797

[1] Values are standardized to a 305-day, 2X, mature equivalent basis.

The averages for milk and fat are from calvings between January 1960 and September 1974 and are the same as averages currently used for PD74 in the MCC. The averages for protein and SNF were not calculated directly from component lactation records because the yields in these records were frequently higher than the PD74 base for milk and fat yield. This was particularly true of the protein data. Therefore the average tests for protein and SNF records were multiplied by the milk average in table 1 to obtain the average pounds of protein or SNF. Breed average percentages for fat, protein, and SNF are in table 2.

Table 2.—Breed averages for milk components

Breed	Fat	Protein	SNF
	Percent	Percent	Percent
Ayrshire	3.95	3.33	8.51
Guernsey	4.73	3.58	9.06
Holstein	3.63	3.15	8.46
Jersey	5.05	3.84	9.39
Brown Swiss	4.03	3.48	8.97
Milking Shorthorn	3.68	3.20	8.62

The average percentages for protein and SNF in table 2 are similar to earlier estimates published by Wilcox et al. (15). However, more records were available for our study than in their report.

Factors for Standardizing 305-Day Protein and Solids-Not-Fat Records for Age and Month of Calving

H. D. Norman, B. G. Cassell, A. L. Kuck, and F. N. Dickinson

The U.S. Department of Agriculture has initiated sire evaluations for protein and solids-not-fat (SNF) to enhance genetic improvement of component production in the Nation's dairy cattle population. Sire evaluations for these two milk components will enable dairymen to make the genetic improvement that will maximize income if milk is priced on the basis of its constituents. Protein and SNF lactation data need adjustment for environmental sources of variation to help insure accurate sire evaluations. Techniques developed for improving the accuracy of sire evaluations for milk and fat are used to provide accurate protein and SNF summaries as well.

Many environmental factors have an important effect on milk and component yield during a lactation. Those presently used to standardize milk and fat yield (12) are (1) length of lactation or number of days milked, (2) frequency of milkings per day, (3) age at calving, and (4) calendar month of calving. This article explains how protein and SNF were standardized for age and month of calving.

A recent report (11) defines the model and presents factors for selected ages and all months of calving for four major dairy breeds. Since all protein and SNF records also contained lactation yield for milk and fat, factors for fat were developed simultaneously with factors for protein and SNF. The age and month-of-calving factors derived from SNF data for Guernseys, Holsteins, and Jerseys are in table 1 along with the factors derived from protein data for Holsteins.

The factors for protein and SNF in each breed were similar to those for fat calculated from the same cows (not shown). This similarity suggested that the adjustment factors used for fat might be adequate for protein and SNF. Regional factors are available for both milk and fat but cannot be calculated for protein and SNF yield at present because the number of records is limited. Separate regional factors for protein and SNF are probably necessary because of the differences among regions in both the milk and the fat factors compared to the overall differences between milk and fat factors.

The ratio of protein or SNF to fat was relatively consistent for age and month-of-calving factors across breeds. We assumed these same relationships would hold across regions within breeds. These relationships were utilized in developing adjustment factors for SNF in Guernseys, Holsteins, and Jerseys and for protein in Holsteins.

The ratio of the factors in table 1 to fat factors from the same component data produced the results in tables 2-5. Regional factors used in calculating sire summaries for protein and SNF were developed by multiplying these ratios by the regional fat factors (12) appropriate for each particular breed. Limited data forced us to use the factors for fat to standardize SNF records for age and month of calving in the Ayrshire and Brown Swiss breeds. We also used the fat factors to standardize protein records in all breeds except Holsteins.

Methods employed in deriving factors to standardize protein and SNF data for age and month of calving for sire evaluations were largely determined because of the small volume of data available for analysis. As the file of component data increases, factors for age and month of calving should be updated in all breeds.

TABLE 1.--AGE AND MONTH-OF-CALVING FACTORS FOR SNF IN GUERNSEYS, HOLSTEINS, AND JERSEYS AND FOR PROTEIN IN HOLSTEINS

	SNF			PROTEIN
CALENDAR MONTH	GUERNSEY	HOLSTEIN	JERSEY	HOLSTEIN
JAN	0.960	0.966	0.966	0.957
FEB	0.956	0.968	0.961	0.964
MAR	0.963	0.970	0.955	0.976
APR	0.967	0.976	0.953	0.985
MAY	0.996	0.990	0.985	1.024
JUN	1.030	1.024	1.018	1.040
JUL	1.058	1.045	1.041	1.039
AUG	1.067	1.051	1.071	1.044
SEP	1.039	1.031	1.061	1.024
OCT	1.010	1.007	1.029	0.983
NOV	0.990	0.993	0.997	0.990
DEC	0.980	0.988	0.980	0.986
AGE (MONTHS)				
18	1.193	1.414	1.701	1.531
19	1.211	1.380	1.578	1.494
20	1.229	1.346	1.470	1.459
21	1.247	1.315	1.377	1.426
22	1.266	1.285	1.295	1.394
23	1.169	1.260	1.307	1.363
24	1.203	1.246	1.277	1.362
25	1.196	1.235	1.240	1.341
26	1.188	1.224	1.223	1.319
27	1.180	1.214	1.223	1.295
28	1.169	1.203	1.214	1.274
29	1.155	1.192	1.199	1.256
30	1.141	1.181	1.191	1.244
31	1.127	1.169	1.188	1.237
32	1.113	1.159	1.174	1.224
33	1.099	1.150	1.151	1.208
34	1.095	1.142	1.140	1.193
35	1.102	1.135	1.142	1.179
36	1.110	1.127	1.145	1.166
37	1.107	1.119	1.134	1.153
38	1.101	1.110	1.121	1.141
39	1.096	1.102	1.109	1.129
40	1.091	1.094	1.099	1.118
41	1.086	1.088	1.093	1.112
42	1.082	1.082	1.087	1.105
43	1.077	1.077	1.082	1.098
44	1.072	1.071	1.076	1.092
45	1.068	1.065	1.071	1.085
46	1.063	1.059	1.066	1.079
47	1.060	1.055	1.061	1.075
48	1.057	1.051	1.058	1.071
49	1.054	1.046	1.054	1.066
50	1.051	1.042	1.050	1.062
51	1.048	1.038	1.047	1.058
52	1.045	1.034	1.043	1.054
53	1.042	1.030	1.040	1.050
54	1.039	1.026	1.036	1.046
55	1.036	1.022	1.033	1.042
56	1.034	1.019	1.031	1.040
57	1.032	1.018	1.031	1.038
58	1.030	1.016	1.030	1.035
59	1.029	1.015	1.029	1.033
60	1.027	1.013	1.029	1.031
61	1.025	1.012	1.028	1.029
62	1.023	1.010	1.028	1.027
63	1.022	1.009	1.027	1.025
64	1.020	1.007	1.027	1.023
65	1.018	1.006	1.026	1.021
66	1.017	1.004	1.025	1.019
67	1.016	1.004	1.022	1.020
68	1.016	1.003	1.019	1.020
69	1.016	1.003	1.016	1.020
70	1.016	1.003	1.013	1.020
71	1.016	1.003	1.010	1.020
72	1.017	1.002	1.007	1.021
73	1.017	1.002	1.004	1.021
74	1.018	1.002	1.007	1.022
75	1.020	1.001	1.011	1.023
76	1.022	1.001	1.015	1.024
77	1.024	1.000	1.019	1.025
78	1.026	1.000	1.023	1.025
79	1.019	1.001	1.024	1.019
80	1.013	1.001	1.025	1.012
81	1.006	1.002	1.026	1.006
82	1.000	1.002	1.027	1.000
83	1.005	1.002	1.018	1.003
84	1.012	1.002	1.009	1.007
85	1.019	1.001	1.000	1.010
86	1.027	1.002	1.002	1.020
87	1.034	1.003	1.005	1.031
88	1.042	1.004	1.008	1.042
89	1.044	1.005	1.011	1.041
90	1.036	1.004	1.014	1.034
91	1.029	1.004	1.017	1.026
92	1.021	1.003	1.020	1.019
93	1.014	1.003	1.023	1.012
94	1.013	1.004	1.025	1.012
95	1.016	1.006	1.026	1.015
96	1.018	1.008	1.028	1.019
97	1.021	1.010	1.030	1.023
98	1.024	1.012	1.031	1.027
99	1.026	1.014	1.033	1.031
100	1.029	1.016	1.035	1.035
101	1.032	1.018	1.036	1.039
102	1.034	1.020	1.038	1.043
103	1.037	1.022	1.039	1.047
104	1.040	1.024	1.041	1.052
105	1.042	1.026	1.043	1.056
106	1.045	1.028	1.044	1.060
107	1.048	1.030	1.046	1.063
108	1.049	1.032	1.047	1.064
109	1.051	1.035	1.048	1.066
110	1.052	1.037	1.049	1.068
111	1.053	1.039	1.051	1.070
112	1.055	1.041	1.052	1.071
113	1.056	1.043	1.053	1.073
114	1.058	1.045	1.054	1.075
115	1.059	1.048	1.055	1.077
116	1.061	1.050	1.056	1.078
117	1.062	1.052	1.057	1.080
118	1.064	1.054	1.059	1.082
119	1.065	1.057	1.060	1.084
120	1.067	1.059	1.061	1.086
121	1.068	1.061	1.062	1.087
122	1.070	1.063	1.063	1.089
123	1.071	1.066	1.064	1.091
124	1.073	1.068	1.066	1.093
125	1.074	1.070	1.067	1.095
126	1.076	1.073	1.068	1.096
127	1.077	1.075	1.069	1.098
128	1.079	1.077	1.070	1.100
129	1.080	1.080	1.071	1.102
130	1.082	1.082	1.073	1.104
131	1.083	1.085	1.074	1.106
132	1.084	1.088	1.077	1.109
133	1.085	1.091	1.079	1.112
134	1.086	1.094	1.081	1.115
135	1.087	1.097	1.084	1.118
136	1.088	1.100	1.086	1.121
137	1.089	1.104	1.088	1.124
138	1.090	1.107	1.091	1.127
139	1.091	1.110	1.093	1.130
140	1.093	1.113	1.095	1.133
141	1.094	1.116	1.098	1.136
142	1.095	1.120	1.100	1.139
143	1.096	1.123	1.103	1.142
144	1.097	1.126	1.105	1.145
145	1.098	1.130	1.108	1.148
146	1.099	1.133	1.110	1.152
147	1.100	1.136	1.112	1.155
148	1.101	1.140	1.115	1.158
149	1.102	1.143	1.117	1.161
150	1.103	1.146	1.120	1.164
151	1.104	1.150	1.122	1.168
152	1.105	1.153	1.125	1.171
153	1.106	1.157	1.127	1.174
154	1.107	1.160	1.130	1.178
155	1.108	1.164	1.132	1.181
156	1.109	1.167	1.135	1.184
157	1.110	1.171	1.138	1.188
158	1.111	1.175	1.140	1.191
159	1.113	1.178	1.143	1.195
160	1.114	1.182	1.145	1.198
161	1.115	1.186	1.148	1.202
162	1.116	1.189	1.151	1.205
163	1.117	1.193	1.153	1.209
164	1.118	1.197	1.156	1.212
165	1.119	1.200	1.158	1.216
166	1.120	1.204	1.161	1.219
167	1.121	1.208	1.164	1.223
168	1.122	1.212	1.167	1.226
169	1.123	1.216	1.169	1.230
170	1.124	1.220	1.172	1.234
171	1.126	1.223	1.175	1.237
172	1.127	1.227	1.177	1.241
173	1.128	1.231	1.180	1.245
174	1.129	1.235	1.183	1.248
175	1.130	1.239	1.186	1.252
176	1.131	1.243	1.189	1.256
177	1.132	1.247	1.191	1.260
178	1.133	1.252	1.194	1.264
179	1.134	1.256	1.197	1.267
180	1.136	1.260	1.200	1.271
181	1.137	1.264	1.203	1.275
182	1.138	1.268	1.206	1.279
183	1.139	1.272	1.208	1.283
184	1.140	1.277	1.211	1.287
185	1.141	1.281	1.214	1.291
186	1.142	1.285	1.217	1.295
187	1.143	1.289	1.220	1.299
188	1.145	1.294	1.223	1.303
189	1.146	1.298	1.226	1.307
190	1.147	1.303	1.229	1.311
191	1.148	1.307	1.232	1.316
192	1.149	1.312	1.235	1.320
193	1.150	1.316	1.238	1.324
194	1.151	1.321	1.241	1.328
195	1.153	1.325	1.244	1.333
196	1.154	1.330	1.247	1.337
197	1.155	1.334	1.250	1.341
198	1.156	1.339	1.254	1.345
199	1.157	1.344	1.257	1.350
200	1.158	1.349	1.260	1.354

TABLE 2.--RATIOS OF SNF TO FAT THAT ARE TO BE MULTIPLIED BY REGIONAL AGE AND MONTH-OF-CALVING FAT FACTORS TO DERIVE ADJUSTMENT FACTORS FOR SNF IN GUERNSEYS

AGE (MONTHS)	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
18--------	0.9308	0.9289	0.9279	0.9270	0.9235	0.9274	0.9328	0.9407	0.9446	0.9393	0.9365	0.9337
19--------	0.9434	0.9414	0.9405	0.9395	0.9360	0.9399	0.9454	0.9534	0.9573	0.9520	0.9492	0.9463
20--------	0.9552	0.9532	0.9522	0.9513	0.9477	0.9516	0.9572	0.9653	0.9693	0.9638	0.9610	0.9581
21--------	0.9669	0.9649	0.9639	0.9629	0.9593	0.9633	0.9689	0.9772	0.9812	0.9757	0.9729	0.9699
22--------	0.9794	0.9773	0.9763	0.9753	0.9716	0.9757	0.9814	0.9897	0.9938	0.9882	0.9854	0.9824
23--------	0.9609	0.9589	0.9580	0.9570	0.9534	0.9574	0.9629	0.9711	0.9751	0.9697	0.9668	0.9639
24--------	0.9721	0.9700	0.9691	0.9681	0.9644	0.9684	0.9741	0.9824	0.9864	0.9809	0.9780	0.9751
25--------	0.9831	0.9811	0.9801	0.9791	0.9754	0.9795	0.9852	0.9936	0.9977	0.9920	0.9892	0.9862
26--------	0.9871	0.9851	0.9841	0.9831	0.9793	0.9834	0.9892	0.9976	1.0017	0.9961	0.9932	0.9902
27--------	0.9846	0.9825	0.9815	0.9805	0.9768	0.9809	0.9866	0.9950	0.9991	0.9935	0.9906	0.9876
28--------	0.9844	0.9824	0.9814	0.9804	0.9767	0.9808	0.9865	0.9949	0.9990	0.9934	0.9905	0.9875
29--------	0.9868	0.9848	0.9838	0.9828	0.9790	0.9831	0.9889	0.9973	1.0014	0.9958	0.9929	0.9899
30--------	0.9867	0.9846	0.9836	0.9826	0.9789	0.9830	0.9887	0.9971	1.0013	0.9956	0.9927	0.9897
31--------	0.9848	0.9828	0.9818	0.9808	0.9771	0.9812	0.9869	0.9953	0.9994	0.9938	0.9909	0.9879
32--------	0.9829	0.9809	0.9799	0.9789	0.9752	0.9793	0.9850	0.9933	0.9974	0.9918	0.9890	0.9860
33--------	0.9810	0.9789	0.9779	0.9769	0.9732	0.9773	0.9830	0.9914	0.9955	0.9899	0.9870	0.9840
34--------	0.9827	0.9806	0.9796	0.9786	0.9749	0.9790	0.9847	0.9931	0.9972	0.9916	0.9887	0.9857
35--------	0.9907	0.9887	0.9877	0.9867	0.9829	0.9870	0.9928	1.0012	1.0054	0.9997	0.9968	0.9938
36--------	0.9997	0.9976	0.9966	0.9956	0.9918	0.9960	1.0018	1.0103	1.0145	1.0088	1.0059	1.0028
37--------	1.0015	0.9994	0.9984	0.9974	0.9937	0.9978	1.0036	1.0122	1.0163	1.0106	1.0077	1.0047
38--------	1.0006	0.9986	0.9976	0.9965	0.9928	0.9969	1.0027	1.0113	1.0154	1.0097	1.0068	1.0038
39--------	1.0007	0.9986	0.9976	0.9966	0.9928	0.9969	1.0027	1.0113	1.0154	1.0097	1.0068	1.0038
40--------	1.0016	0.9995	0.9985	0.9975	0.9937	0.9979	1.0037	1.0122	1.0164	1.0107	1.0078	1.0047
41--------	1.0016	0.9995	0.9985	0.9975	0.9937	0.9979	1.0037	1.0122	1.0164	1.0107	1.0078	1.0047
42--------	1.0016	0.9995	0.9985	0.9975	0.9937	0.9979	1.0037	1.0122	1.0164	1.0107	1.0078	1.0047
43--------	1.0016	0.9995	0.9985	0.9975	0.9938	0.9979	1.0037	1.0123	1.0164	1.0107	1.0078	1.0048
44--------	1.0017	0.9996	0.9986	0.9976	0.9938	0.9979	1.0037	1.0123	1.0165	1.0107	1.0078	1.0048
45--------	1.0026	1.0005	0.9995	0.9985	0.9947	0.9989	1.0047	1.0133	1.0174	1.0117	1.0088	1.0057
46--------	1.0017	0.9996	0.9986	0.9976	0.9938	0.9980	1.0038	1.0123	1.0165	1.0108	1.0078	1.0048
47--------	1.0017	0.9996	0.9986	0.9976	0.9938	0.9980	1.0038	1.0123	1.0165	1.0108	1.0079	1.0048
48--------	1.0027	1.0006	0.9996	0.9986	0.9948	0.9989	1.0048	1.0133	1.0175	1.0118	1.0088	1.0058
49--------	1.0027	1.0006	0.9996	0.9986	0.9948	0.9989	1.0048	1.0133	1.0175	1.0118	1.0088	1.0058
50--------	1.0027	1.0006	0.9996	0.9986	0.9948	0.9990	1.0048	1.0133	1.0175	1.0118	1.0089	1.0058
51--------	1.0027	1.0006	0.9996	0.9986	0.9948	0.9990	1.0048	1.0133	1.0175	1.0118	1.0089	1.0058
52--------	1.0027	1.0006	0.9996	0.9986	0.9948	0.9990	1.0048	1.0134	1.0175	1.0118	1.0089	1.0058
53--------	1.0027	1.0006	0.9996	0.9986	0.9948	0.9990	1.0048	1.0134	1.0176	1.0118	1.0089	1.0058
54--------	1.0027	1.0006	0.9996	0.9986	0.9948	0.9990	1.0048	1.0134	1.0176	1.0118	1.0089	1.0059
55--------	1.0028	1.0007	0.9997	0.9987	0.9949	0.9990	1.0048	1.0134	1.0176	1.0119	1.0089	1.0059
56--------	1.0028	1.0007	0.9997	0.9987	0.9949	0.9990	1.0049	1.0134	1.0176	1.0119	1.0089	1.0059
57--------	1.0018	0.9997	0.9987	0.9977	0.9939	0.9981	1.0039	1.0124	1.0166	1.0109	1.0080	1.0049
58--------	1.0018	0.9997	0.9987	0.9977	0.9939	0.9981	1.0039	1.0124	1.0166	1.0109	1.0080	1.0049
59--------	1.0028	1.0007	0.9997	0.9987	0.9949	0.9991	1.0049	1.0134	1.0176	1.0119	1.0090	1.0059
60--------	1.0018	0.9997	0.9987	0.9977	0.9939	0.9981	1.0039	1.0124	1.0166	1.0109	1.0080	1.0049
61--------	1.0018	0.9997	0.9987	0.9977	0.9939	0.9981	1.0039	1.0125	1.0166	1.0109	1.0080	1.0049
62--------	1.0018	0.9997	0.9987	0.9977	0.9939	0.9981	1.0039	1.0125	1.0166	1.0109	1.0080	1.0050
63--------	1.0018	0.9997	0.9987	0.9977	0.9939	0.9981	1.0039	1.0125	1.0166	1.0109	1.0080	1.0050
64--------	1.0018	0.9998	0.9988	0.9977	0.9940	0.9981	1.0039	1.0125	1.0167	1.0109	1.0080	1.0050
65--------	1.0019	0.9998	0.9988	0.9978	0.9940	0.9981	1.0039	1.0125	1.0167	1.0110	1.0080	1.0050
66--------	1.0019	0.9998	0.9988	0.9978	0.9940	0.9981	1.0039	1.0125	1.0167	1.0110	1.0080	1.0050
67--------	1.0009	0.9988	0.9978	0.9968	0.9930	0.9972	1.0030	1.0115	1.0157	1.0100	1.0070	1.0040
68--------	0.9999	0.9978	0.9968	0.9958	0.9920	0.9962	1.0020	1.0105	1.0147	1.0090	1.0060	1.0030
69--------	0.9989	0.9968	0.9958	0.9948	0.9910	0.9952	1.0010	1.0095	1.0137	1.0080	1.0050	1.0020
70--------	0.9979	0.9958	0.9948	0.9938	0.9901	0.9942	1.0000	1.0085	1.0127	1.0070	1.0041	1.0010
71--------	0.9969	0.9949	0.9939	0.9929	0.9891	0.9932	0.9990	1.0075	1.0117	1.0060	1.0031	1.0000
72--------	0.9969	0.9949	0.9939	0.9929	0.9891	0.9932	0.9990	1.0075	1.0117	1.0060	1.0031	1.0000
73--------	0.9960	0.9939	0.9929	0.9919	0.9881	0.9923	0.9980	1.0065	1.0107	1.0050	1.0021	0.9991
74--------	0.9950	0.9929	0.9919	0.9909	0.9872	0.9913	0.9971	1.0055	1.0097	1.0040	1.0011	0.9981
75--------	0.9940	0.9919	0.9909	0.9900	0.9862	0.9903	0.9961	1.0046	1.0087	1.0030	1.0001	0.9971
76--------	0.9931	0.9910	0.9900	0.9890	0.9852	0.9894	0.9951	1.0036	1.0077	1.0021	0.9992	0.9961
77--------	0.9931	0.9910	0.9900	0.9890	0.9852	0.9894	0.9951	1.0036	1.0077	1.0021	0.9992	0.9962
78--------	0.9921	0.9900	0.9891	0.9881	0.9843	0.9884	0.9942	1.0026	1.0068	1.0011	0.9982	0.9952
79--------	0.9930	0.9910	0.9900	0.9890	0.9852	0.9894	0.9951	1.0036	1.0077	1.0021	0.9992	0.9961
80--------	0.9950	0.9929	0.9919	0.9909	0.9871	0.9913	0.9970	1.0055	1.0097	1.0040	1.0011	0.9981
81--------	0.9959	0.9939	0.9929	0.9919	0.9881	0.9922	0.9980	1.0065	1.0107	1.0050	1.0021	0.9990
82--------	0.9979	0.9958	0.9948	0.9938	0.9901	0.9942	1.0000	1.0085	1.0127	1.0070	1.0041	1.0010
83--------	0.9969	0.9948	0.9938	0.9928	0.9891	0.9932	0.9990	1.0075	1.0117	1.0060	1.0031	1.0000
84--------	0.9960	0.9939	0.9929	0.9919	0.9881	0.9922	0.9980	1.0065	1.0107	1.0050	1.0021	0.9990
85--------	0.9960	0.9939	0.9929	0.9919	0.9881	0.9923	0.9980	1.0065	1.0107	1.0050	1.0021	0.9991
86--------	0.9950	0.9929	0.9919	0.9909	0.9872	0.9913	0.9971	1.0056	1.0097	1.0040	1.0011	0.9981
87--------	0.9941	0.9920	0.9910	0.9900	0.9862	0.9904	0.9961	1.0046	1.0088	1.0031	1.0002	0.9972
88--------	0.9932	0.9911	0.9901	0.9891	0.9853	0.9895	0.9952	1.0037	1.0078	1.0022	0.9993	0.9962
89--------	0.9922	0.9901	0.9892	0.9882	0.9844	0.9885	0.9943	1.0027	1.0069	1.0012	0.9983	0.9953
90--------	0.9912	0.9892	0.9882	0.9872	0.9834	0.9875	0.9933	1.0017	1.0059	1.0002	0.9973	0.9943
91--------	0.9912	0.9891	0.9881	0.9871	0.9834	0.9875	0.9932	1.0017	1.0058	1.0002	0.9973	0.9943
92--------	0.9902	0.9881	0.9871	0.9861	0.9824	0.9865	0.9922	1.0007	1.0048	0.9992	0.9963	0.9932
93--------	0.9901	0.9880	0.9870	0.9861	0.9823	0.9864	0.9922	1.0006	1.0047	0.9991	0.9962	0.9932
94--------	0.9891	0.9871	0.9861	0.9851	0.9813	0.9855	0.9912	0.9996	1.0038	0.9981	0.9952	0.9922
95--------	0.9901	0.9881	0.9871	0.9861	0.9823	0.9864	0.9922	1.0006	1.0048	0.9991	0.9962	0.9932
96--------	0.9892	0.9871	0.9861	0.9851	0.9814	0.9855	0.9912	0.9997	1.0038	0.9982	0.9953	0.9922
97--------	0.9892	0.9871	0.9861	0.9851	0.9814	0.9855	0.9913	0.9997	1.0038	0.9982	0.9953	0.9923
98--------	0.9902	0.9881	0.9871	0.9861	0.9824	0.9865	0.9922	1.0007	1.0048	0.9992	0.9963	0.9933
99--------	0.9892	0.9872	0.9862	0.9852	0.9814	0.9856	0.9913	0.9997	1.0039	0.9982	0.9953	0.9923
100--------	0.9893	0.9872	0.9862	0.9852	0.9815	0.9856	0.9913	0.9998	1.0039	0.9982	0.9954	0.9923
101--------	0.9902	0.9882	0.9872	0.9862	0.9824	0.9866	0.9923	1.0007	1.0049	0.9992	0.9963	0.9933
102--------	0.9893	0.9872	0.9863	0.9853	0.9815	0.9856	0.9914	0.9998	1.0039	0.9983	0.9954	0.9924
103--------	0.9893	0.9873	0.9863	0.9853	0.9815	0.9857	0.9914	0.9998	1.0040	0.9983	0.9954	0.9924
104--------	0.9903	0.9882	0.9872	0.9862	0.9825	0.9866	0.9924	1.0008	1.0049	0.9993	0.9964	0.9934
105--------	0.9894	0.9873	0.9863	0.9853	0.9816	0.9857	0.9914	0.9999	1.0040	0.9984	0.9955	0.9924
106--------	0.9894	0.9873	0.9863	0.9853	0.9816	0.9857	0.9915	0.9999	1.0040	0.9984	0.9955	0.9925
107--------	0.9894	0.9874	0.9864	0.9854	0.9816	0.9857	0.9915	0.9999	1.0040	0.9984	0.9955	0.9925
108--------	0.9885	0.9864	0.9854	0.9844	0.9807	0.9848	0.9906	0.9990	1.0031	0.9975	0.9946	0.9916
109--------	0.9885	0.9864	0.9855	0.9845	0.9807	0.9848	0.9906	0.9990	1.0031	0.9975	0.9946	0.9916

TABLE 2.--CONTINUED

AGE (MONTHS)	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
110--------	0.9876	0.9855	0.9845	0.9835	0.9798	0.9839	0.9897	0.9981	1.0022	0.9966	0.9937	0.9907
111--------	0.9867	0.9846	0.9836	0.9826	0.9789	0.9830	0.9887	0.9971	1.0013	0.9956	0.9927	0.9897
112--------	0.9867	0.9846	0.9836	0.9827	0.9789	0.9830	0.9888	0.9972	1.0013	0.9957	0.9928	0.9898
113--------	0.9849	0.9828	0.9818	0.9808	0.9771	0.9812	0.9869	0.9953	0.9994	0.9938	0.9909	0.9879
114--------	0.9849	0.9828	0.9818	0.9809	0.9771	0.9812	0.9869	0.9953	0.9994	0.9938	0.9909	0.9879
115--------	0.9840	0.9819	0.9809	0.9800	0.9762	0.9803	0.9860	0.9944	0.9985	0.9929	0.9900	0.9870
116--------	0.9840	0.9820	0.9810	0.9800	0.9763	0.9803	0.9861	0.9944	0.9986	0.9929	0.9901	0.9871
117--------	0.9822	0.9801	0.9792	0.9782	0.9745	0.9785	0.9842	0.9926	0.9967	0.9911	0.9882	0.9852
118--------	0.9822	0.9802	0.9792	0.9782	0.9745	0.9786	0.9843	0.9926	0.9967	0.9911	0.9883	0.9853
119--------	0.9813	0.9793	0.9783	0.9773	0.9736	0.9777	0.9834	0.9917	0.9958	0.9902	0.9874	0.9844
120--------	0.9814	0.9793	0.9783	0.9773	0.9736	0.9777	0.9834	0.9918	0.9959	0.9903	0.9874	0.9844
121--------	0.9796	0.9775	0.9765	0.9756	0.9719	0.9759	0.9816	0.9900	0.9941	0.9885	0.9856	0.9826
122--------	0.9796	0.9776	0.9766	0.9756	0.9719	0.9760	0.9817	0.9900	0.9941	0.9885	0.9856	0.9827
123--------	0.9787	0.9767	0.9757	0.9747	0.9710	0.9751	0.9808	0.9891	0.9932	0.9876	0.9847	0.9818
124--------	0.9788	0.9767	0.9757	0.9748	0.9711	0.9751	0.9808	0.9891	0.9932	0.9876	0.9848	0.9818
125--------	0.9770	0.9750	0.9740	0.9730	0.9693	0.9734	0.9790	0.9874	0.9914	0.9859	0.9830	0.9800
126--------	0.9770	0.9750	0.9740	0.9730	0.9693	0.9734	0.9791	0.9874	0.9915	0.9859	0.9830	0.9801
127--------	0.9762	0.9741	0.9731	0.9722	0.9685	0.9725	0.9782	0.9865	0.9906	0.9850	0.9822	0.9792
128--------	0.9753	0.9733	0.9723	0.9713	0.9676	0.9717	0.9774	0.9857	0.9897	0.9842	0.9813	0.9784
129--------	0.9745	0.9724	0.9714	0.9705	0.9668	0.9708	0.9765	0.9848	0.9889	0.9833	0.9805	0.9775
130--------	0.9745	0.9725	0.9715	0.9705	0.9668	0.9709	0.9765	0.9848	0.9889	0.9833	0.9805	0.9775
131--------	0.9736	0.9716	0.9706	0.9697	0.9660	0.9700	0.9757	0.9840	0.9880	0.9825	0.9796	0.9767
132--------	0.9745	0.9725	0.9715	0.9706	0.9669	0.9709	0.9766	0.9849	0.9890	0.9834	0.9805	0.9776
133--------	0.9754	0.9734	0.9724	0.9714	0.9678	0.9718	0.9775	0.9858	0.9899	0.9843	0.9814	0.9785
134--------	0.9755	0.9734	0.9724	0.9715	0.9678	0.9718	0.9775	0.9858	0.9899	0.9843	0.9815	0.9785
135--------	0.9764	0.9743	0.9733	0.9724	0.9687	0.9727	0.9784	0.9867	0.9908	0.9852	0.9824	0.9794
136--------	0.9764	0.9743	0.9734	0.9724	0.9687	0.9728	0.9784	0.9867	0.9908	0.9852	0.9824	0.9794
137--------	0.9773	0.9752	0.9743	0.9733	0.9696	0.9736	0.9793	0.9876	0.9917	0.9862	0.9833	0.9803
138--------	0.9782	0.9761	0.9752	0.9742	0.9705	0.9745	0.9802	0.9886	0.9926	0.9871	0.9842	0.9812
139--------	0.9782	0.9761	0.9752	0.9742	0.9705	0.9746	0.9802	0.9886	0.9927	0.9871	0.9842	0.9812
140--------	0.9800	0.9779	0.9770	0.9760	0.9723	0.9763	0.9820	0.9904	0.9945	0.9889	0.9860	0.9830
141--------	0.9809	0.9788	0.9779	0.9769	0.9732	0.9772	0.9829	0.9913	0.9954	0.9898	0.9869	0.9839
142--------	0.9809	0.9788	0.9779	0.9769	0.9732	0.9773	0.9829	0.9913	0.9954	0.9898	0.9869	0.9839
143--------	0.9818	0.9797	0.9788	0.9778	0.9741	0.9781	0.9838	0.9922	0.9963	0.9907	0.9878	0.9848
144--------	0.9827	0.9806	0.9797	0.9787	0.9750	0.9790	0.9847	0.9931	0.9972	0.9916	0.9887	0.9857
145--------	0.9827	0.9807	0.9797	0.9787	0.9750	0.9790	0.9848	0.9931	0.9972	0.9916	0.9887	0.9858
146--------	0.9836	0.9815	0.9806	0.9796	0.9759	0.9799	0.9857	0.9940	0.9981	0.9925	0.9896	0.9867
147--------	0.9845	0.9824	0.9815	0.9805	0.9767	0.9808	0.9865	0.9949	0.9990	0.9934	0.9905	0.9876
148--------	0.9845	0.9824	0.9815	0.9805	0.9768	0.9808	0.9866	0.9950	0.9991	0.9934	0.9906	0.9876
149--------	0.9854	0.9833	0.9824	0.9814	0.9776	0.9817	0.9875	0.9959	1.0000	0.9943	0.9915	0.9885
150--------	0.9854	0.9834	0.9824	0.9814	0.9777	0.9817	0.9875	0.9959	1.0000	0.9944	0.9915	0.9885
151--------	0.9863	0.9842	0.9833	0.9823	0.9785	0.9826	0.9884	0.9968	1.0009	0.9953	0.9924	0.9894
152--------	0.9872	0.9851	0.9841	0.9832	0.9794	0.9835	0.9893	0.9977	1.0018	0.9962	0.9933	0.9903
153--------	0.9872	0.9851	0.9842	0.9832	0.9794	0.9835	0.9893	0.9977	1.0018	0.9962	0.9933	0.9903
154--------	0.9881	0.9860	0.9850	0.9841	0.9803	0.9844	0.9902	0.9986	1.0027	0.9971	0.9942	0.9912
155--------	0.9890	0.9869	0.9859	0.9849	0.9812	0.9853	0.9911	0.9995	1.0036	0.9980	0.9951	0.9921
156--------	0.9890	0.9869	0.9859	0.9850	0.9812	0.9853	0.9911	0.9995	1.0036	0.9980	0.9951	0.9921
157--------	0.9899	0.9878	0.9868	0.9858	0.9821	0.9862	0.9920	1.0004	1.0045	0.9989	0.9960	0.9930
158--------	0.9908	0.9887	0.9877	0.9867	0.9830	0.9871	0.9929	1.0013	1.0054	0.9998	0.9969	0.9939
159--------	0.9917	0.9896	0.9886	0.9876	0.9839	0.9880	0.9937	1.0022	1.0063	1.0007	0.9978	0.9948
160--------	0.9926	0.9905	0.9895	0.9885	0.9848	0.9889	0.9946	1.0031	1.0072	1.0016	0.9987	0.9957
161--------	0.9926	0.9905	0.9895	0.9885	0.9848	0.9889	0.9946	1.0031	1.0073	1.0016	0.9987	0.9957
162--------	0.9935	0.9914	0.9904	0.9894	0.9856	0.9898	0.9955	1.0040	1.0082	1.0025	0.9996	0.9966
163--------	0.9944	0.9923	0.9913	0.9903	0.9865	0.9907	0.9964	1.0049	1.0091	1.0034	1.0005	0.9974
164--------	0.9944	0.9923	0.9913	0.9903	0.9865	0.9907	0.9964	1.0049	1.0091	1.0034	1.0005	0.9975
165--------	0.9953	0.9932	0.9922	0.9912	0.9874	0.9916	0.9973	1.0058	1.0100	1.0043	1.0014	0.9983
166--------	0.9961	0.9941	0.9931	0.9921	0.9883	0.9924	0.9982	1.0067	1.0109	1.0052	1.0023	0.9992
167--------	0.9961	0.9941	0.9931	0.9921	0.9883	0.9924	0.9982	1.0067	1.0109	1.0052	1.0023	0.9992
168--------	0.9970	0.9949	0.9939	0.9929	0.9892	0.9933	0.9991	1.0076	1.0118	1.0061	1.0032	1.0001
169--------	0.9979	0.9958	0.9948	0.9938	0.9901	0.9942	1.0000	1.0085	1.0127	1.0070	1.0041	1.0010
170--------	0.9979	0.9958	0.9948	0.9938	0.9901	0.9942	1.0000	1.0085	1.0127	1.0070	1.0041	1.0010
171--------	0.9997	0.9976	0.9966	0.9956	0.9918	0.9960	1.0018	1.0103	1.0145	1.0088	1.0058	1.0028
172--------	0.9997	0.9976	0.9966	0.9956	0.9918	0.9960	1.0018	1.0103	1.0145	1.0088	1.0058	1.0028
173--------	1.0006	0.9985	0.9975	0.9965	0.9927	0.9969	1.0027	1.0112	1.0154	1.0097	1.0067	1.0037
174--------	1.0015	0.9994	0.9984	0.9974	0.9936	0.9977	1.0036	1.0121	1.0163	1.0106	1.0076	1.0046
175--------	1.0015	0.9994	0.9984	0.9974	0.9936	0.9977	1.0036	1.0121	1.0163	1.0106	1.0076	1.0046
176--------	1.0024	1.0003	0.9993	0.9982	0.9945	0.9986	1.0044	1.0130	1.0172	1.0114	1.0085	1.0055
177--------	1.0032	1.0011	1.0001	0.9991	0.9953	0.9995	1.0053	1.0139	1.0181	1.0123	1.0094	1.0064
178--------	1.0032	1.0011	1.0001	0.9991	0.9953	0.9995	1.0053	1.0139	1.0181	1.0123	1.0094	1.0063
179--------	1.0041	1.0020	1.0010	1.0000	0.9962	1.0004	1.0062	1.0148	1.0190	1.0132	1.0103	1.0072
180--------	1.0059	1.0038	1.0028	1.0018	0.9980	1.0021	1.0080	1.0166	1.0208	1.0150	1.0121	1.0090
181--------	1.0059	1.0038	1.0028	1.0018	0.9980	1.0021	1.0080	1.0166	1.0208	1.0150	1.0121	1.0090
182--------	1.0068	1.0047	1.0037	1.0026	0.9988	1.0030	1.0089	1.0174	1.0216	1.0159	1.0130	1.0099
183--------	1.0068	1.0047	1.0036	1.0026	0.9988	1.0030	1.0089	1.0174	1.0216	1.0159	1.0129	1.0099
184--------	1.0076	1.0055	1.0045	1.0035	0.9997	1.0039	1.0097	1.0183	1.0225	1.0168	1.0138	1.0108
185--------	1.0085	1.0064	1.0054	1.0044	1.0006	1.0048	1.0106	1.0192	1.0234	1.0177	1.0147	1.0117
186--------	1.0085	1.0064	1.0054	1.0044	1.0006	1.0048	1.0106	1.0192	1.0234	1.0177	1.0147	1.0117
187--------	1.0094	1.0073	1.0063	1.0053	1.0014	1.0056	1.0115	1.0201	1.0243	1.0186	1.0156	1.0125
188--------	1.0112	1.0091	1.0080	1.0070	1.0032	1.0074	1.0133	1.0219	1.0261	1.0203	1.0174	1.0143
189--------	1.0112	1.0090	1.0080	1.0070	1.0032	1.0074	1.0133	1.0219	1.0261	1.0203	1.0174	1.0143
190--------	1.0120	1.0099	1.0089	1.0079	1.0041	1.0083	1.0141	1.0228	1.0270	1.0212	1.0183	1.0152
191--------	1.0120	1.0099	1.0089	1.0079	1.0041	1.0083	1.0141	1.0228	1.0270	1.0212	1.0182	1.0152
192--------	1.0129	1.0108	1.0098	1.0088	1.0049	1.0091	1.0150	1.0237	1.0279	1.0221	1.0191	1.0161
193--------	1.0138	1.0117	1.0107	1.0096	1.0058	1.0100	1.0159	1.0245	1.0288	1.0230	1.0200	1.0169
194--------	1.0138	1.0117	1.0106	1.0096	1.0058	1.0100	1.0159	1.0245	1.0288	1.0230	1.0200	1.0169
195--------	1.0155	1.0134	1.0124	1.0114	1.0075	1.0118	1.0177	1.0263	1.0305	1.0248	1.0218	1.0187
196--------	1.0164	1.0143	1.0133	1.0123	1.0084	1.0126	1.0185	1.0272	1.0314	1.0256	1.0227	1.0196
197--------	1.0164	1.0143	1.0133	1.0122	1.0084	1.0126	1.0185	1.0272	1.0314	1.0256	1.0226	1.0196
198--------	1.0173	1.0152	1.0141	1.0131	1.0093	1.0135	1.0194	1.0281	1.0323	1.0265	1.0235	1.0204
199--------	1.0182	1.0160	1.0150	1.0140	1.0101	1.0144	1.0203	1.0290	1.0332	1.0274	1.0244	1.0213
200--------	1.0181	1.0160	1.0150	1.0140	1.0101	1.0144	1.0203	1.0289	1.0332	1.0274	1.0244	1.0213

TABLE 3.--RATIOS OF SNF TO FAT THAT ARE TO BE MULTIPLIED BY REGIONAL AGE AND MONTH-OF-CALVING FAT FACTORS TO DERIVE ADJUSTMENT FACTORS FOR SNF IN HOLSTEINS

AGE (MONTHS)	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
18--------	0.9837	0.9817	0.9807	0.9787	0.9828	0.9858	0.9877	0.9915	0.9935	0.9946	0.9917	0.9887
19--------	0.9841	0.9821	0.9811	0.9791	0.9832	0.9862	0.9881	0.9918	0.9939	0.9950	0.9921	0.9891
20--------	0.9837	0.9817	0.9807	0.9788	0.9828	0.9858	0.9877	0.9915	0.9935	0.9947	0.9918	0.9888
21--------	0.9842	0.9822	0.9812	0.9792	0.9833	0.9863	0.9882	0.9920	0.9940	0.9951	0.9922	0.9892
22--------	0.9846	0.9826	0.9816	0.9797	0.9837	0.9867	0.9886	0.9924	0.9945	0.9956	0.9927	0.9897
23--------	0.9821	0.9801	0.9791	0.9771	0.9812	0.9842	0.9861	0.9899	0.9919	0.9930	0.9901	0.9871
24--------	0.9827	0.9807	0.9797	0.9777	0.9818	0.9848	0.9867	0.9905	0.9925	0.9937	0.9907	0.9878
25--------	0.9842	0.9821	0.9811	0.9792	0.9832	0.9862	0.9882	0.9919	0.9940	0.9951	0.9922	0.9892
26--------	0.9856	0.9836	0.9826	0.9807	0.9847	0.9877	0.9896	0.9934	0.9955	0.9966	0.9937	0.9907
27--------	0.9880	0.9859	0.9849	0.9830	0.9870	0.9901	0.9920	0.9958	0.9978	0.9990	0.9960	0.9930
28--------	0.9895	0.9875	0.9865	0.9845	0.9886	0.9916	0.9935	0.9973	0.9994	1.0005	0.9976	0.9946
29--------	0.9903	0.9882	0.9872	0.9853	0.9893	0.9924	0.9943	0.9981	1.0001	1.0013	0.9984	0.9953
30--------	0.9910	0.9890	0.9880	0.9860	0.9901	0.9931	0.9951	0.9989	1.0009	1.0021	0.9991	0.9961
31--------	0.9910	0.9889	0.9879	0.9860	0.9900	0.9931	0.9950	0.9988	1.0008	1.0020	0.9991	0.9961
32--------	0.9918	0.9897	0.9887	0.9868	0.9908	0.9939	0.9958	0.9996	1.0016	1.0028	0.9999	0.9969
33--------	0.9917	0.9897	0.9887	0.9867	0.9908	0.9938	0.9958	0.9996	1.0016	1.0028	0.9998	0.9968
34--------	0.9917	0.9897	0.9887	0.9867	0.9908	0.9938	0.9957	0.9995	1.0016	1.0027	0.9998	0.9968
35--------	0.9908	0.9888	0.9878	0.9858	0.9899	0.9929	0.9948	0.9986	1.0007	1.0018	0.9989	0.9959
36--------	0.9899	0.9878	0.9868	0.9849	0.9890	0.9920	0.9939	0.9977	0.9997	1.0009	0.9980	0.9950
37--------	0.9898	0.9878	0.9868	0.9848	0.9889	0.9919	0.9939	0.9976	0.9997	1.0009	0.9979	0.9949
38--------	0.9889	0.9869	0.9859	0.9839	0.9880	0.9910	0.9929	0.9967	0.9987	0.9999	0.9970	0.9940
39--------	0.9897	0.9877	0.9867	0.9847	0.9888	0.9918	0.9937	0.9975	0.9996	1.0007	0.9978	0.9948
40--------	0.9897	0.9876	0.9866	0.9847	0.9887	0.9918	0.9937	0.9975	0.9995	1.0007	0.9978	0.9948
41--------	0.9896	0.9876	0.9866	0.9846	0.9887	0.9917	0.9937	0.9974	0.9995	1.0006	0.9977	0.9947
42--------	0.9905	0.9885	0.9875	0.9855	0.9896	0.9926	0.9945	0.9983	1.0004	1.0015	0.9986	0.9956
43--------	0.9914	0.9893	0.9883	0.9864	0.9905	0.9935	0.9954	0.9992	1.0013	1.0024	0.9995	0.9965
44--------	0.9923	0.9902	0.9892	0.9873	0.9913	0.9944	0.9963	1.0001	1.0022	1.0033	1.0004	0.9974
45--------	0.9922	0.9902	0.9892	0.9872	0.9913	0.9944	0.9963	1.0001	1.0021	1.0033	1.0004	0.9973
46--------	0.9932	0.9911	0.9901	0.9881	0.9922	0.9953	0.9972	1.0010	1.0030	1.0042	1.0013	0.9983
47--------	0.9931	0.9911	0.9901	0.9881	0.9922	0.9953	0.9972	1.0010	1.0030	1.0042	1.0013	0.9982
48--------	0.9941	0.9920	0.9910	0.9890	0.9931	0.9962	0.9981	1.0019	1.0040	1.0051	1.0022	0.9992
49--------	0.9941	0.9920	0.9910	0.9890	0.9931	0.9962	0.9981	1.0019	1.0040	1.0051	1.0022	0.9992
50--------	0.9940	0.9920	0.9910	0.9890	0.9931	0.9962	0.9981	1.0019	1.0039	1.0051	1.0022	0.9992
51--------	0.9950	0.9929	0.9919	0.9900	0.9941	0.9971	0.9990	1.0028	1.0049	1.0061	1.0031	1.0001
52--------	0.9950	0.9929	0.9919	0.9900	0.9941	0.9971	0.9990	1.0028	1.0049	1.0061	1.0031	1.0001
53--------	0.9959	0.9939	0.9929	0.9909	0.9950	0.9981	1.0000	1.0038	1.0059	1.0070	1.0041	1.0011
54--------	0.9959	0.9939	0.9929	0.9909	0.9950	0.9981	1.0000	1.0038	1.0059	1.0070	1.0041	1.0011
55--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0080	1.0051	1.0020
56--------	0.9959	0.9939	0.9929	0.9909	0.9950	0.9980	1.0000	1.0038	1.0058	1.0070	1.0041	1.0010
57--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0080	1.0051	1.0020
58--------	0.9959	0.9939	0.9929	0.9909	0.9950	0.9980	1.0000	1.0038	1.0058	1.0070	1.0041	1.0010
59--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0080	1.0051	1.0020
60--------	0.9959	0.9939	0.9929	0.9909	0.9950	0.9980	1.0000	1.0038	1.0058	1.0070	1.0041	1.0010
61--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0080	1.0051	1.0020
62--------	0.9959	0.9939	0.9929	0.9909	0.9950	0.9980	1.0000	1.0038	1.0058	1.0070	1.0041	1.0010
63--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0080	1.0051	1.0020
64--------	0.9959	0.9939	0.9929	0.9909	0.9950	0.9980	1.0000	1.0038	1.0058	1.0070	1.0041	1.0010
65--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0080	1.0051	1.0020
66--------	0.9959	0.9939	0.9929	0.9909	0.9950	0.9980	1.0000	1.0038	1.0058	1.0070	1.0041	1.0010
67--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0080	1.0051	1.0020
68--------	0.9959	0.9939	0.9929	0.9909	0.9950	0.9980	1.0000	1.0038	1.0058	1.0070	1.0041	1.0010
69--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0080	1.0051	1.0020
70--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0080	1.0051	1.0020
71--------	0.9979	0.9959	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0090	1.0061	1.0030
72--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0060	1.0051	1.0020
73--------	0.9979	0.9959	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0090	1.0061	1.0030
74--------	0.9979	0.9959	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0030	1.0061	1.0030
75--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0080	1.0051	1.0020
76--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0080	1.0051	1.0020
77--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0080	1.0051	1.0020
78--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0080	1.0051	1.0020
79--------	0.9979	0.9959	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0090	1.0061	1.0030
80--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0080	1.0051	1.0020
81--------	0.9979	0.9959	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0090	1.0061	1.0030
82--------	0.9969	0.9949	0.9939	0.9919	0.9960	0.9990	1.0010	1.0048	1.0068	1.0080	1.0051	1.0020
83--------	0.9979	0.9959	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0090	1.0061	1.0030
84--------	0.9989	0.9969	0.9958	0.9939	0.9980	1.0010	1.0030	1.0068	1.0088	1.0100	1.0071	1.0040
85--------	0.9979	0.9959	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0090	1.0061	1.0030
86--------	0.9979	0.9959	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0090	1.0061	1.0030
87--------	0.9979	0.9959	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0090	1.0061	1.0030
88--------	0.9979	0.9959	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0090	1.0061	1.0030
89--------	0.9989	0.9968	0.9958	0.9938	0.9980	1.0010	1.0030	1.0068	1.0088	1.0100	1.0071	1.0040
90--------	0.9979	0.9959	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0090	1.0061	1.0030
91--------	0.9989	0.9968	0.9958	0.9938	0.9980	1.0010	1.0030	1.0068	1.0088	1.0100	1.0071	1.0040
92--------	0.9979	0.9959	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0090	1.0061	1.0030
93--------	0.9979	0.9959	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0090	1.0061	1.0030
94--------	0.9979	0.9959	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0090	1.0061	1.0030
95--------	0.9979	0.9959	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0090	1.0061	1.0030
96--------	0.9979	0.9958	0.9948	0.9929	0.9970	1.0000	1.0020	1.0058	1.0078	1.0090	1.0061	1.0030
97--------	0.9979	0.9958	0.9948	0.9929	0.9970	1.0000	1.0019	1.0058	1.0078	1.0090	1.0061	1.0030
98--------	0.9979	0.9958	0.9948	0.9929	0.9970	1.0000	1.0019	1.0058	1.0078	1.0090	1.0061	1.0030
99--------	0.9979	0.9958	0.9948	0.9928	0.9970	1.0000	1.0019	1.0058	1.0078	1.0090	1.0061	1.0030
100--------	0.9979	0.9958	0.9948	0.9928	0.9970	1.0000	1.0019	1.0058	1.0078	1.0090	1.0061	1.0030
101--------	0.9989	0.9968	0.9958	0.9938	0.9979	1.0010	1.0029	1.0068	1.0088	1.0100	1.0070	1.0040
102--------	0.9989	0.9968	0.9958	0.9938	0.9979	1.0010	1.0029	1.0068	1.0088	1.0100	1.0070	1.0040
103--------	0.9989	0.9968	0.9958	0.9938	0.9979	1.0010	1.0029	1.0068	1.0088	1.0100	1.0070	1.0040
104--------	0.9989	0.9968	0.9958	0.9938	0.9979	1.0010	1.0029	1.0067	1.0088	1.0100	1.0070	1.0040
105--------	0.9989	0.9968	0.9958	0.9938	0.9979	1.0010	1.0029	1.0067	1.0088	1.0100	1.0070	1.0040
106--------	0.9988	0.9968	0.9958	0.9938	0.9979	1.0010	1.0029	1.0067	1.0088	1.0100	1.0070	1.0040
107--------	0.9988	0.9968	0.9958	0.9938	0.9979	1.0010	1.0029	1.0067	1.0088	1.0100	1.0070	1.0040
108--------	0.9988	0.9968	0.9958	0.9938	0.9979	1.0010	1.0029	1.0067	1.0088	1.0100	1.0070	1.0040
109--------	0.9998	0.9978	0.9967	0.9948	0.9989	1.0019	1.0039	1.0077	1.0098	1.0109	1.0080	1.0049

TABLE 3.--CONTINUED

AGE (MONTHS)	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
110	0.9998	0.9977	0.9967	0.9947	0.9989	1.0019	1.0039	1.0077	1.0098	1.0109	1.0080	1.0049
111	0.9998	0.9977	0.9967	0.9947	0.9989	1.0019	1.0039	1.0077	1.0098	1.0109	1.0080	1.0049
112	0.9988	0.9968	0.9958	0.9938	0.9979	1.0009	1.0029	1.0067	1.0088	1.0099	1.0070	1.0040
113	0.9988	0.9968	0.9958	0.9938	0.9979	1.0009	1.0029	1.0067	1.0088	1.0099	1.0070	1.0040
114	0.9988	0.9968	0.9958	0.9938	0.9979	1.0009	1.0029	1.0067	1.0088	1.0099	1.0070	1.0039
115	0.9998	0.9977	0.9967	0.9947	0.9988	1.0019	1.0038	1.0077	1.0097	1.0109	1.0079	1.0049
116	0.9998	0.9977	0.9967	0.9947	0.9988	1.0019	1.0038	1.0077	1.0097	1.0109	1.0079	1.0049
117	0.9998	0.9977	0.9967	0.9947	0.9988	1.0019	1.0038	1.0077	1.0097	1.0109	1.0079	1.0049
118	0.9997	0.9977	0.9967	0.9947	0.9988	1.0019	1.0038	1.0076	1.0097	1.0109	1.0079	1.0049
119	1.0007	0.9986	0.9976	0.9956	0.9998	1.0028	1.0048	1.0086	1.0107	1.0118	1.0089	1.0058
120	1.0007	0.9986	0.9976	0.9956	0.9998	1.0028	1.0048	1.0086	1.0107	1.0118	1.0089	1.0058
121	1.0007	0.9986	0.9976	0.9956	0.9997	1.0028	1.0047	1.0086	1.0106	1.0118	1.0089	1.0058
122	1.0007	0.9986	0.9976	0.9956	0.9997	1.0028	1.0047	1.0086	1.0106	1.0118	1.0089	1.0058
123	1.0007	0.9986	0.9976	0.9956	0.9997	1.0028	1.0047	1.0086	1.0106	1.0118	1.0088	1.0058
124	1.0007	0.9986	0.9976	0.9956	0.9997	1.0028	1.0047	1.0086	1.0106	1.0118	1.0088	1.0058
125	1.0006	0.9986	0.9976	0.9956	0.9997	1.0028	1.0047	1.0085	1.0106	1.0118	1.0088	1.0058
126	1.0016	0.9995	0.9985	0.9965	1.0006	1.0037	1.0056	1.0095	1.0115	1.0127	1.0098	1.0067
127	1.0016	0.9995	0.9985	0.9965	1.0006	1.0037	1.0056	1.0095	1.0115	1.0127	1.0098	1.0067
128	1.0016	0.9995	0.9985	0.9965	1.0006	1.0037	1.0056	1.0095	1.0115	1.0127	1.0097	1.0067
129	1.0015	0.9995	0.9985	0.9965	1.0006	1.0037	1.0056	1.0095	1.0115	1.0127	1.0097	1.0067
130	1.0015	0.9995	0.9985	0.9965	1.0006	1.0037	1.0056	1.0094	1.0115	1.0127	1.0097	1.0067
131	1.0024	1.0004	0.9994	0.9974	1.0015	1.0046	1.0065	1.0104	1.0124	1.0136	1.0106	1.0076
132	1.0024	1.0004	0.9994	0.9974	1.0015	1.0046	1.0065	1.0104	1.0124	1.0136	1.0106	1.0076
133	1.0024	1.0004	0.9993	0.9974	1.0015	1.0045	1.0065	1.0103	1.0124	1.0136	1.0106	1.0076
134	1.0024	1.0003	0.9993	0.9973	1.0015	1.0045	1.0065	1.0103	1.0124	1.0136	1.0106	1.0076
135	1.0024	1.0003	0.9993	0.9973	1.0015	1.0045	1.0065	1.0103	1.0124	1.0136	1.0106	1.0075
136	1.0024	1.0003	0.9993	0.9973	1.0014	1.0045	1.0064	1.0103	1.0124	1.0135	1.0106	1.0075
137	1.0033	1.0012	1.0002	0.9982	1.0023	1.0054	1.0073	1.0112	1.0133	1.0144	1.0115	1.0084
138	1.0042	1.0021	1.0011	0.9991	1.0032	1.0063	1.0082	1.0121	1.0142	1.0153	1.0124	1.0093
139	1.0041	1.0021	1.0011	0.9991	1.0032	1.0063	1.0082	1.0121	1.0141	1.0153	1.0124	1.0093
140	1.0041	1.0021	1.0010	0.9991	1.0032	1.0063	1.0082	1.0121	1.0141	1.0153	1.0123	1.0093
141	1.0041	1.0020	1.0010	0.9990	1.0032	1.0062	1.0082	1.0120	1.0141	1.0153	1.0123	1.0093
142	1.0050	1.0029	1.0019	0.9999	1.0040	1.0071	1.0091	1.0129	1.0150	1.0162	1.0132	1.0101
143	1.0050	1.0029	1.0019	0.9999	1.0040	1.0071	1.0090	1.0129	1.0150	1.0162	1.0132	1.0101
144	1.0049	1.0029	1.0019	0.9999	1.0040	1.0071	1.0090	1.0129	1.0149	1.0161	1.0132	1.0101
145	1.0058	1.0037	1.0027	1.0007	1.0049	1.0079	1.0099	1.0138	1.0158	1.0170	1.0140	1.0110
146	1.0058	1.0037	1.0027	1.0007	1.0048	1.0079	1.0099	1.0137	1.0158	1.0170	1.0140	1.0110
147	1.0058	1.0037	1.0027	1.0007	1.0048	1.0079	1.0098	1.0137	1.0158	1.0170	1.0140	1.0109
148	1.0066	1.0046	1.0035	1.0015	1.0057	1.0088	1.0107	1.0146	1.0166	1.0178	1.0149	1.0118
149	1.0066	1.0045	1.0035	1.0015	1.0057	1.0087	1.0107	1.0145	1.0166	1.0178	1.0148	1.0118
150	1.0066	1.0045	1.0035	1.0015	1.0056	1.0087	1.0107	1.0145	1.0166	1.0178	1.0148	1.0117
151	1.0065	1.0045	1.0035	1.0014	1.0056	1.0087	1.0106	1.0145	1.0166	1.0177	1.0148	1.0117
152	1.0065	1.0044	1.0034	1.0014	1.0056	1.0086	1.0106	1.0145	1.0165	1.0177	1.0147	1.0117
153	1.0074	1.0053	1.0043	1.0023	1.0064	1.0095	1.0114	1.0153	1.0174	1.0186	1.0156	1.0125
154	1.0073	1.0053	1.0042	1.0022	1.0064	1.0095	1.0114	1.0153	1.0174	1.0185	1.0156	1.0125
155	1.0082	1.0061	1.0051	1.0031	1.0072	1.0103	1.0123	1.0161	1.0182	1.0194	1.0164	1.0133
156	1.0081	1.0061	1.0050	1.0030	1.0072	1.0103	1.0122	1.0161	1.0182	1.0194	1.0164	1.0133
157	1.0081	1.0060	1.0050	1.0030	1.0072	1.0102	1.0122	1.0161	1.0181	1.0193	1.0163	1.0133
158	1.0089	1.0069	1.0058	1.0038	1.0080	1.0111	1.0130	1.0169	1.0190	1.0202	1.0172	1.0141
159	1.0089	1.0068	1.0058	1.0038	1.0080	1.0110	1.0130	1.0169	1.0189	1.0201	1.0171	1.0141
160	1.0097	1.0076	1.0066	1.0046	1.0088	1.0119	1.0138	1.0177	1.0198	1.0210	1.0180	1.0149
161	1.0097	1.0076	1.0066	1.0046	1.0087	1.0118	1.0138	1.0177	1.0197	1.0209	1.0179	1.0149
162	1.0096	1.0076	1.0065	1.0045	1.0087	1.0118	1.0137	1.0176	1.0197	1.0209	1.0179	1.0148
163	1.0105	1.0084	1.0074	1.0054	1.0095	1.0126	1.0146	1.0184	1.0205	1.0217	1.0187	1.0156
164	1.0104	1.0083	1.0073	1.0053	1.0095	1.0126	1.0145	1.0184	1.0205	1.0217	1.0187	1.0156
165	1.0104	1.0083	1.0073	1.0053	1.0094	1.0125	1.0145	1.0184	1.0204	1.0216	1.0186	1.0156
166	1.0112	1.0091	1.0081	1.0061	1.0102	1.0133	1.0153	1.0192	1.0213	1.0224	1.0195	1.0164
167	1.0111	1.0091	1.0080	1.0060	1.0102	1.0133	1.0152	1.0191	1.0212	1.0224	1.0194	1.0163
168	1.0119	1.0099	1.0088	1.0068	1.0110	1.0141	1.0160	1.0199	1.0220	1.0232	1.0202	1.0171
169	1.0119	1.0098	1.0088	1.0068	1.0109	1.0140	1.0160	1.0199	1.0220	1.0232	1.0202	1.0171
170	1.0127	1.0106	1.0096	1.0076	1.0117	1.0148	1.0168	1.0207	1.0228	1.0240	1.0210	1.0179
171	1.0126	1.0106	1.0095	1.0075	1.0117	1.0148	1.0168	1.0206	1.0227	1.0239	1.0209	1.0178
172	1.0126	1.0105	1.0095	1.0075	1.0116	1.0147	1.0167	1.0206	1.0227	1.0239	1.0209	1.0178
173	1.0134	1.0113	1.0103	1.0083	1.0124	1.0155	1.0175	1.0214	1.0235	1.0247	1.0217	1.0186
174	1.0133	1.0112	1.0102	1.0082	1.0124	1.0155	1.0174	1.0213	1.0234	1.0246	1.0216	1.0185
175	1.0133	1.0112	1.0102	1.0081	1.0123	1.0154	1.0174	1.0213	1.0234	1.0245	1.0215	1.0185
176	1.0140	1.0120	1.0109	1.0089	1.0131	1.0162	1.0182	1.0220	1.0241	1.0253	1.0223	1.0192
177	1.0140	1.0119	1.0109	1.0089	1.0130	1.0161	1.0181	1.0220	1.0241	1.0253	1.0223	1.0192
178	1.0156	1.0135	1.0125	1.0104	1.0146	1.0177	1.0197	1.0236	1.0257	1.0269	1.0239	1.0208
179	1.0155	1.0134	1.0124	1.0104	1.0146	1.0177	1.0196	1.0235	1.0256	1.0268	1.0238	1.0207
180	1.0154	1.0134	1.0123	1.0103	1.0145	1.0176	1.0196	1.0235	1.0256	1.0267	1.0237	1.0207
181	1.0162	1.0141	1.0131	1.0111	1.0153	1.0184	1.0203	1.0242	1.0263	1.0275	1.0245	1.0214
182	1.0161	1.0141	1.0130	1.0110	1.0152	1.0183	1.0203	1.0242	1.0263	1.0275	1.0245	1.0214
183	1.0161	1.0140	1.0130	1.0109	1.0151	1.0182	1.0202	1.0241	1.0262	1.0274	1.0244	1.0213
184	1.0168	1.0147	1.0137	1.0117	1.0159	1.0190	1.0209	1.0248	1.0269	1.0281	1.0251	1.0220
185	1.0176	1.0155	1.0144	1.0124	1.0166	1.0197	1.0217	1.0256	1.0277	1.0289	1.0259	1.0228
186	1.0175	1.0154	1.0144	1.0124	1.0165	1.0197	1.0216	1.0255	1.0276	1.0288	1.0258	1.0227
187	1.0174	1.0153	1.0143	1.0123	1.0165	1.0196	1.0216	1.0255	1.0276	1.0288	1.0258	1.0227
188	1.0181	1.0161	1.0150	1.0130	1.0172	1.0203	1.0223	1.0262	1.0283	1.0295	1.0265	1.0234
189	1.0181	1.0160	1.0150	1.0129	1.0171	1.0202	1.0222	1.0261	1.0282	1.0294	1.0264	1.0233
190	1.0188	1.0167	1.0157	1.0137	1.0178	1.0210	1.0229	1.0268	1.0289	1.0301	1.0271	1.0240
191	1.0195	1.0174	1.0164	1.0144	1.0186	1.0217	1.0237	1.0276	1.0297	1.0309	1.0279	1.0248
192	1.0202	1.0181	1.0171	1.0151	1.0193	1.0224	1.0244	1.0283	1.0304	1.0316	1.0286	1.0255
193	1.0202	1.0181	1.0170	1.0150	1.0192	1.0223	1.0243	1.0282	1.0303	1.0315	1.0285	1.0254
194	1.0209	1.0188	1.0177	1.0157	1.0199	1.0230	1.0250	1.0289	1.0310	1.0322	1.0292	1.0261
195	1.0208	1.0187	1.0177	1.0156	1.0198	1.0230	1.0249	1.0289	1.0310	1.0322	1.0291	1.0260
196	1.0215	1.0194	1.0184	1.0163	1.0205	1.0237	1.0256	1.0296	1.0317	1.0329	1.0298	1.0267
197	1.0214	1.0193	1.0183	1.0162	1.0205	1.0236	1.0256	1.0295	1.0316	1.0328	1.0298	1.0267
198	1.0213	1.0192	1.0182	1.0162	1.0204	1.0235	1.0255	1.0294	1.0315	1.0327	1.0297	1.0266
199	1.0220	1.0199	1.0189	1.0168	1.0210	1.0242	1.0262	1.0301	1.0322	1.0334	1.0304	1.0273
200	1.0227	1.0206	1.0195	1.0175	1.0217	1.0249	1.0268	1.0308	1.0329	1.0341	1.0310	1.0279

TABLE 4.--RATIOS OF SNF TO FAT THAT ARE TO BE MULTIPLIED BY REGIONAL AGE AND MONTH-OF-CALVING FAT FACTORS TO DERIVE ADJUSTMENT FACTORS FOR SNF IN JERSEYS

AGE (MONTHS)	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
18---------	1.0146	1.0094	1.0093	1.0062	1.0045	1.0078	1.0158	1.0273	1.0303	1.0338	1.0208	1.0199
19---------	1.0062	1.0010	1.0010	0.9978	0.9962	0.9995	1.0073	1.0188	1.0218	1.0252	1.0124	1.0114
20---------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
21---------	0.9907	0.9856	0.9856	0.9825	0.9808	0.9841	0.9918	1.0031	1.0061	1.0095	0.9968	0.9958
22---------	0.9850	0.9799	0.9799	0.9768	0.9752	0.9784	0.9861	0.9973	1.0002	1.0036	0.9910	0.9901
23---------	0.9866	0.9815	0.9815	0.9784	0.9768	0.9800	0.9877	0.9989	1.0019	1.0053	0.9926	0.9917
24---------	0.9940	0.9889	0.9889	0.9858	0.9841	0.9874	0.9951	1.0064	1.0094	1.0128	1.0001	0.9992
25---------	0.9923	0.9872	0.9872	0.9841	0.9824	0.9857	0.9934	1.0047	1.0077	1.0111	0.9984	0.9974
26---------	0.9931	0.9879	0.9879	0.9848	0.9831	0.9864	0.9942	1.0054	1.0084	1.0118	0.9991	0.9982
27---------	0.9955	0.9903	0.9903	0.9872	0.9855	0.9888	0.9966	1.0079	1.0109	1.0143	1.0016	1.0006
28---------	0.9971	0.9920	0.9919	0.9888	0.9872	0.9904	0.9982	1.0095	1.0125	1.0160	1.0032	1.0022
29---------	0.9996	0.9944	0.9944	0.9913	0.9896	0.9929	1.0007	1.0121	1.0151	1.0185	1.0057	1.0047
30---------	1.0038	0.9986	0.9986	0.9955	0.9938	0.9971	1.0049	1.0164	1.0194	1.0228	1.0100	1.0090
31---------	1.0081	1.0029	1.0029	0.9997	0.9980	1.0014	1.0092	1.0207	1.0237	1.0272	1.0143	1.0133
32---------	1.0091	1.0039	1.0038	1.0007	0.9990	1.0023	1.0102	1.0217	1.0247	1.0282	1.0153	1.0143
33---------	1.0067	1.0015	1.0014	0.9983	0.9966	0.9999	1.0078	1.0192	1.0223	1.0257	1.0128	1.0119
34---------	1.0050	0.9998	0.9997	0.9966	0.9949	0.9982	1.0061	1.0175	1.0205	1.0240	1.0111	1.0102
35---------	1.0050	0.9998	0.9997	0.9966	0.9949	0.9982	1.0061	1.0175	1.0205	1.0240	1.0111	1.0101
36---------	1.0050	0.9998	0.9997	0.9966	0.9949	0.9982	1.0061	1.0175	1.0205	1.0240	1.0111	1.0101
37---------	1.0068	1.0016	1.0016	0.9984	0.9968	1.0001	1.0079	1.0194	1.0224	1.0258	1.0130	1.0120
38---------	1.0069	1.0017	1.0017	0.9985	0.9969	1.0002	1.0080	1.0195	1.0225	1.0260	1.0131	1.0121
39---------	1.0079	1.0027	1.0027	0.9995	0.9979	1.0012	1.0090	1.0205	1.0235	1.0270	1.0141	1.0131
40---------	1.0099	1.0047	1.0046	1.0015	0.9998	1.0031	1.0110	1.0225	1.0255	1.0290	1.0160	1.0151
41---------	1.0090	1.0038	1.0037	1.0006	0.9989	1.0022	1.0101	1.0216	1.0246	1.0281	1.0152	1.0142
42---------	1.0091	1.0039	1.0038	1.0007	0.9990	1.0023	1.0102	1.0217	1.0247	1.0281	1.0152	1.0143
43---------	1.0091	1.0039	1.0039	1.0007	0.9990	1.0024	1.0102	1.0217	1.0247	1.0282	1.0153	1.0143
44---------	1.0092	1.0040	1.0039	1.0008	0.9991	1.0024	1.0103	1.0218	1.0248	1.0283	1.0154	1.0144
45---------	1.0092	1.0040	1.0040	1.0008	0.9992	1.0025	1.0104	1.0218	1.0249	1.0283	1.0154	1.0144
46---------	1.0093	1.0041	1.0040	1.0009	0.9992	1.0025	1.0104	1.0219	1.0249	1.0284	1.0155	1.0145
47---------	1.0093	1.0041	1.0041	1.0009	0.9993	1.0026	1.0105	1.0219	1.0250	1.0284	1.0155	1.0145
48---------	1.0094	1.0042	1.0041	1.0010	0.9993	1.0026	1.0105	1.0220	1.0250	1.0285	1.0155	1.0146
49---------	1.0094	1.0042	1.0042	1.0010	0.9993	1.0027	1.0105	1.0220	1.0250	1.0285	1.0156	1.0146
50---------	1.0095	1.0042	1.0042	1.0011	0.9994	1.0027	1.0106	1.0221	1.0251	1.0286	1.0156	1.0147
51---------	1.0095	1.0043	1.0042	1.0011	0.9994	1.0027	1.0106	1.0221	1.0251	1.0286	1.0157	1.0147
52---------	1.0095	1.0043	1.0043	1.0011	0.9995	1.0028	1.0107	1.0221	1.0252	1.0286	1.0157	1.0147
53---------	1.0106	1.0053	1.0053	1.0021	1.0005	1.0038	1.0117	1.0232	1.0262	1.0297	1.0167	1.0158
54---------	1.0096	1.0044	1.0044	1.0012	0.9995	1.0029	1.0107	1.0222	1.0252	1.0287	1.0158	1.0148
55---------	1.0107	1.0054	1.0054	1.0022	1.0006	1.0039	1.0118	1.0233	1.0263	1.0298	1.0168	1.0159
56---------	1.0097	1.0045	1.0044	1.0013	0.9996	1.0029	1.0108	1.0223	1.0253	1.0288	1.0159	1.0149
57---------	1.0097	1.0045	1.0044	1.0013	0.9996	1.0029	1.0108	1.0223	1.0253	1.0288	1.0159	1.0149
58---------	1.0097	1.0045	1.0044	1.0013	0.9996	1.0029	1.0108	1.0223	1.0253	1.0288	1.0159	1.0149
59---------	1.0087	1.0035	1.0034	1.0003	0.9986	1.0019	1.0098	1.0213	1.0243	1.0278	1.0149	1.0139
60---------	1.0087	1.0035	1.0034	1.0003	0.9986	1.0019	1.0098	1.0213	1.0243	1.0278	1.0149	1.0139
61---------	1.0077	1.0025	1.0025	0.9993	0.9977	1.0010	1.0089	1.0203	1.0233	1.0268	1.0139	1.0129
62---------	1.0077	1.0025	1.0025	0.9993	0.9977	1.0010	1.0089	1.0203	1.0233	1.0268	1.0139	1.0129
63---------	1.0068	1.0015	1.0015	0.9984	0.9967	1.0000	1.0079	1.0193	1.0223	1.0258	1.0129	1.0119
64---------	1.0077	1.0025	1.0025	0.9993	0.9977	1.0010	1.0089	1.0203	1.0233	1.0268	1.0139	1.0129
65---------	1.0068	1.0016	1.0015	0.9984	0.9967	1.0000	1.0079	1.0193	1.0223	1.0258	1.0129	1.0119
66---------	1.0058	1.0006	1.0005	0.9974	0.9957	0.9990	1.0069	1.0183	1.0213	1.0248	1.0119	1.0110
67---------	1.0048	0.9996	0.9996	0.9964	0.9948	0.9981	1.0059	1.0173	1.0204	1.0238	1.0110	1.0100
68---------	1.0048	0.9996	0.9996	0.9965	0.9948	0.9981	1.0059	1.0174	1.0204	1.0238	1.0110	1.0100
69---------	1.0039	0.9987	0.9986	0.9955	0.9938	0.9971	1.0050	1.0164	1.0194	1.0228	1.0100	1.0090
70---------	1.0029	0.9977	0.9976	0.9945	0.9929	0.9962	1.0040	1.0154	1.0184	1.0218	1.0090	1.0080
71---------	1.0029	0.9977	0.9977	0.9945	0.9929	0.9962	1.0040	1.0154	1.0184	1.0219	1.0090	1.0081
72---------	1.0019	0.9967	0.9967	0.9936	0.9919	0.9952	1.0030	1.0144	1.0174	1.0209	1.0080	1.0071
73---------	1.0009	0.9957	0.9957	0.9926	0.9909	0.9942	1.0020	1.0134	1.0164	1.0198	1.0070	1.0061
74---------	0.9999	0.9947	0.9947	0.9916	0.9899	0.9932	1.0010	1.0124	1.0154	1.0188	1.0060	1.0051
75---------	0.9999	0.9947	0.9947	0.9916	0.9899	0.9932	1.0010	1.0124	1.0154	1.0188	1.0060	1.0051
76---------	0.9999	0.9947	0.9947	0.9916	0.9899	0.9932	1.0010	1.0124	1.0154	1.0188	1.0060	1.0051
77---------	0.9989	0.9937	0.9937	0.9906	0.9889	0.9922	1.0000	1.0114	1.0144	1.0178	1.0050	1.0041
78---------	0.9989	0.9937	0.9937	0.9906	0.9889	0.9922	1.0000	1.0114	1.0144	1.0178	1.0050	1.0041
79---------	0.9989	0.9937	0.9937	0.9906	0.9889	0.9922	1.0000	1.0114	1.0144	1.0178	1.0050	1.0041
80---------	0.9989	0.9937	0.9937	0.9906	0.9889	0.9922	1.0000	1.0114	1.0144	1.0178	1.0050	1.0041
81---------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
82---------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
83---------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
84---------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
85---------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
86---------	0.9959	0.9908	0.9907	0.9876	0.9860	0.9893	0.9970	1.0084	1.0114	1.0148	1.0020	1.0011
87---------	0.9940	0.9888	0.9888	0.9857	0.9840	0.9873	0.9951	1.0064	1.0094	1.0128	1.0000	0.9991
88---------	0.9920	0.9869	0.9868	0.9838	0.9821	0.9854	0.9931	1.0044	1.0074	1.0108	0.9981	0.9971
89---------	0.9920	0.9869	0.9869	0.9838	0.9821	0.9854	0.9931	1.0044	1.0074	1.0108	0.9981	0.9972
90---------	0.9940	0.9889	0.9888	0.9857	0.9841	0.9873	0.9951	1.0064	1.0094	1.0128	1.0001	0.9991
91---------	0.9960	0.9908	0.9908	0.9877	0.9860	0.9893	0.9971	1.0084	1.0114	1.0148	1.0021	1.0011
92---------	0.9989	0.9937	0.9937	0.9906	0.9889	0.9922	1.0000	1.0114	1.0144	1.0178	1.0050	1.0041
93---------	1.0009	0.9957	0.9956	0.9925	0.9909	0.9942	1.0020	1.0133	1.0164	1.0198	1.0070	1.0060
94---------	1.0018	0.9967	0.9966	0.9935	0.9918	0.9951	1.0030	1.0143	1.0173	1.0208	1.0080	1.0070
95---------	1.0009	0.9957	0.9956	0.9925	0.9909	0.9941	1.0020	1.0133	1.0163	1.0198	1.0070	1.0060
96---------	1.0009	0.9957	0.9956	0.9925	0.9909	0.9941	1.0020	1.0133	1.0163	1.0198	1.0070	1.0060
97---------	1.0008	0.9957	0.9956	0.9925	0.9908	0.9941	1.0020	1.0133	1.0163	1.0198	1.0070	1.0060
98---------	0.9999	0.9947	0.9947	0.9915	0.9899	0.9932	1.0010	1.0123	1.0153	1.0188	1.0060	1.0050
99---------	0.9999	0.9947	0.9947	0.9915	0.9899	0.9932	1.0010	1.0123	1.0153	1.0188	1.0060	1.0050
100---------	0.9999	0.9947	0.9946	0.9915	0.9899	0.9932	1.0010	1.0123	1.0153	1.0188	1.0060	1.0050
101---------	0.9989	0.9937	0.9937	0.9906	0.9889	0.9922	1.0000	1.0114	1.0143	1.0178	1.0050	1.0040
102---------	0.9989	0.9937	0.9937	0.9906	0.9889	0.9922	1.0000	1.0114	1.0143	1.0178	1.0050	1.0040
103---------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
104---------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
105---------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
106---------	0.9970	0.9918	0.9918	0.9887	0.9870	0.9903	0.9981	1.0094	1.0124	1.0158	1.0031	1.0021
107---------	0.9970	0.9918	0.9918	0.9887	0.9870	0.9903	0.9981	1.0094	1.0124	1.0158	1.0031	1.0021
108---------	0.9970	0.9918	0.9918	0.9887	0.9870	0.9903	0.9981	1.0094	1.0124	1.0158	1.0031	1.0021
109---------	0.9970	0.9918	0.9918	0.9887	0.9870	0.9903	0.9981	1.0094	1.0124	1.0158	1.0031	1.0021

TABLE 4.--CONTINUED

AGE (MONTHS)	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
110--------	0.9970	0.9918	0.9918	0.9887	0.9870	0.9903	0.9981	1.0094	1.0124	1.0158	1.0031	1.0021
111--------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
112--------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
113--------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
114--------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
115--------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
116--------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
117--------	0.9979	0.9928	0.9927	0.9896	0.9880	0.9912	0.9990	1.0104	1.0134	1.0168	1.0040	1.0031
118--------	0.9989	0.9937	0.9937	0.9906	0.9889	0.9922	1.0000	1.0113	1.0143	1.0178	1.0050	1.0040
119--------	0.9989	0.9937	0.9937	0.9906	0.9889	0.9922	1.0000	1.0113	1.0143	1.0178	1.0050	1.0040
120--------	0.9989	0.9937	0.9937	0.9905	0.9889	0.9922	1.0000	1.0113	1.0143	1.0178	1.0050	1.0040
121--------	0.9989	0.9937	0.9937	0.9905	0.9889	0.9922	1.0000	1.0113	1.0143	1.0178	1.0050	1.0040
122--------	0.9989	0.9937	0.9937	0.9905	0.9889	0.9922	1.0000	1.0113	1.0143	1.0178	1.0050	1.0040
123--------	0.9989	0.9937	0.9937	0.9905	0.9889	0.9922	1.0000	1.0113	1.0143	1.0178	1.0050	1.0040
124--------	0.9998	0.9946	0.9946	0.9915	0.9898	0.9931	1.0009	1.0123	1.0153	1.0187	1.0059	1.0050
125--------	0.9998	0.9946	0.9946	0.9915	0.9898	0.9931	1.0009	1.0123	1.0153	1.0187	1.0059	1.0050
126--------	0.9998	0.9946	0.9946	0.9915	0.9898	0.9931	1.0009	1.0123	1.0153	1.0187	1.0059	1.0050
127--------	0.9998	0.9946	0.9946	0.9915	0.9898	0.9931	1.0009	1.0123	1.0153	1.0187	1.0059	1.0050
128--------	0.9998	0.9946	0.9946	0.9915	0.9898	0.9931	1.0009	1.0123	1.0153	1.0187	1.0059	1.0049
129--------	0.9998	0.9946	0.9946	0.9915	0.9898	0.9931	1.0009	1.0123	1.0153	1.0187	1.0059	1.0049
130--------	1.0007	0.9956	0.9955	0.9924	0.9907	0.9940	1.0018	1.0132	1.0162	1.0196	1.0068	1.0059
131--------	0.9998	0.9946	0.9946	0.9915	0.9898	0.9931	1.0009	1.0123	1.0153	1.0187	1.0059	1.0049
132--------	1.0007	0.9955	0.9955	0.9924	0.9907	0.9940	1.0018	1.0132	1.0162	1.0196	1.0068	1.0059
133--------	1.0007	0.9955	0.9955	0.9924	0.9907	0.9940	1.0018	1.0132	1.0162	1.0196	1.0068	1.0059
134--------	0.9998	0.9946	0.9946	0.9914	0.9898	0.9931	1.0009	1.0122	1.0152	1.0187	1.0059	1.0049
135--------	1.0007	0.9955	0.9955	0.9924	0.9907	0.9940	1.0018	1.0132	1.0162	1.0196	1.0068	1.0059
136--------	1.0007	0.9955	0.9955	0.9924	0.9907	0.9940	1.0018	1.0132	1.0162	1.0196	1.0068	1.0058
137--------	1.0007	0.9955	0.9955	0.9924	0.9907	0.9940	1.0018	1.0132	1.0162	1.0196	1.0068	1.0058
138--------	1.0007	0.9955	0.9955	0.9923	0.9907	0.9940	1.0018	1.0132	1.0162	1.0196	1.0068	1.0058
139--------	1.0007	0.9955	0.9955	0.9923	0.9907	0.9940	1.0018	1.0132	1.0162	1.0196	1.0068	1.0058
140--------	1.0007	0.9955	0.9955	0.9923	0.9907	0.9940	1.0018	1.0132	1.0162	1.0196	1.0068	1.0058
141--------	1.0007	0.9955	0.9954	0.9923	0.9907	0.9940	1.0018	1.0131	1.0161	1.0196	1.0068	1.0058
142--------	1.0007	0.9955	0.9954	0.9923	0.9907	0.9939	1.0018	1.0131	1.0161	1.0196	1.0068	1.0058
143--------	1.0016	0.9964	0.9963	0.9932	0.9916	0.9948	1.0027	1.0141	1.0171	1.0205	1.0077	1.0067
144--------	1.0006	0.9955	0.9954	0.9923	0.9907	0.9939	1.0018	1.0131	1.0161	1.0196	1.0068	1.0058
145--------	1.0016	0.9964	0.9963	0.9932	0.9915	0.9948	1.0027	1.0140	1.0170	1.0205	1.0077	1.0067
146--------	1.0015	0.9964	0.9963	0.9932	0.9915	0.9948	1.0027	1.0140	1.0170	1.0205	1.0077	1.0067
147--------	1.0006	0.9955	0.9954	0.9923	0.9906	0.9939	1.0017	1.0131	1.0161	1.0195	1.0067	1.0058
148--------	1.0015	0.9963	0.9963	0.9932	0.9915	0.9948	1.0026	1.0140	1.0170	1.0205	1.0076	1.0067
149--------	1.0006	0.9954	0.9954	0.9923	0.9806	0.9939	1.0017	1.0131	1.0161	1.0195	1.0067	1.0058
150--------	1.0015	0.9963	0.9963	0.9932	0.9915	0.9948	1.0026	1.0140	1.0170	1.0204	1.0076	1.0067
151--------	1.0006	0.9954	0.9954	0.9923	0.9906	0.9939	1.0017	1.0131	1.0161	1.0195	1.0067	1.0058
152--------	1.0015	0.9963	0.9963	0.9931	0.9915	0.9948	1.0026	1.0140	1.0170	1.0204	1.0076	1.0066
153--------	1.0015	0.9963	0.9963	0.9931	0.9915	0.9948	1.0026	1.0140	1.0170	1.0204	1.0076	1.0066
154--------	1.0015	0.9963	0.9962	0.9931	0.9915	0.9948	1.0026	1.0140	1.0170	1.0204	1.0076	1.0066
155--------	1.0015	0.9963	0.9962	0.9931	0.9915	0.9948	1.0026	1.0140	1.0170	1.0204	1.0076	1.0066
156--------	1.0015	0.9963	0.9962	0.9931	0.9915	0.9947	1.0026	1.0140	1.0170	1.0204	1.0076	1.0066
157--------	1.0023	0.9972	0.9971	0.9940	0.9923	0.9956	1.0034	1.0148	1.0178	1.0213	1.0085	1.0075
158--------	1.0014	0.9963	0.9962	0.9931	0.9914	0.9947	1.0026	1.0139	1.0169	1.0204	1.0076	1.0066
159--------	1.0023	0.9971	0.9971	0.9940	0.9923	0.9956	1.0034	1.0148	1.0178	1.0213	1.0084	1.0075
160--------	1.0014	0.9962	0.9962	0.9931	0.9914	0.9947	1.0025	1.0139	1.0169	1.0204	1.0075	1.0066
161--------	1.0023	0.9971	0.9971	0.9939	0.9923	0.9956	1.0034	1.0148	1.0178	1.0212	1.0084	1.0075
162--------	1.0023	0.9971	0.9971	0.9939	0.9923	0.9956	1.0034	1.0148	1.0178	1.0212	1.0084	1.0074
163--------	1.0014	0.9962	0.9962	0.9931	0.9914	0.9947	1.0025	1.0139	1.0169	1.0203	1.0075	1.0066
164--------	1.0023	0.9971	0.9970	0.9939	0.9923	0.9955	1.0034	1.0148	1.0178	1.0212	1.0084	1.0074
165--------	1.0014	0.9962	0.9962	0.9930	0.9914	0.9947	1.0025	1.0139	1.0169	1.0203	1.0075	1.0065
166--------	1.0022	0.9971	0.9970	0.9939	0.9922	0.9955	1.0034	1.0147	1.0178	1.0212	1.0084	1.0074
167--------	1.0022	0.9971	0.9970	0.9939	0.9922	0.9955	1.0033	1.0147	1.0177	1.0212	1.0084	1.0074
168--------	1.0022	0.9970	0.9970	0.9939	0.9922	0.9955	1.0033	1.0147	1.0177	1.0212	1.0083	1.0074
169--------	1.0022	0.9970	0.9970	0.9939	0.9922	0.9955	1.0033	1.0147	1.0177	1.0212	1.0083	1.0074
170--------	1.0022	0.9970	0.9970	0.9939	0.9922	0.9955	1.0033	1.0147	1.0177	1.0212	1.0083	1.0074
171--------	1.0031	0.9979	0.9978	0.9947	0.9930	0.9963	1.0042	1.0156	1.0186	1.0220	1.0092	1.0082
172--------	1.0022	0.9970	0.9970	0.9938	0.9922	0.9955	1.0033	1.0147	1.0177	1.0211	1.0083	1.0073
173--------	1.0022	0.9970	0.9969	0.9938	0.9922	0.9955	1.0033	1.0147	1.0177	1.0211	1.0083	1.0073
174--------	1.0022	0.9970	0.9969	0.9938	0.9922	0.9954	1.0033	1.0147	1.0177	1.0211	1.0083	1.0073
175--------	1.0030	0.9978	0.9978	0.9946	0.9930	0.9963	1.0041	1.0155	1.0185	1.0220	1.0091	1.0082
176--------	1.0030	0.9978	0.9978	0.9946	0.9930	0.9963	1.0041	1.0155	1.0185	1.0220	1.0091	1.0082
177--------	1.0021	0.9970	0.9969	0.9938	0.9921	0.9954	1.0033	1.0146	1.0176	1.0211	1.0083	1.0073
178--------	1.0030	0.9978	0.9977	0.9946	0.9930	0.9962	1.0041	1.0155	1.0185	1.0219	1.0091	1.0081
179--------	1.0030	0.9978	0.9977	0.9946	0.9929	0.9962	1.0041	1.0155	1.0185	1.0219	1.0091	1.0081
180--------	1.0029	0.9978	0.9977	0.9946	0.9929	0.9962	1.0041	1.0155	1.0185	1.0219	1.0091	1.0081
181--------	1.0029	0.9977	0.9977	0.9946	0.9929	0.9962	1.0040	1.0154	1.0185	1.0219	1.0091	1.0081
182--------	1.0029	0.9977	0.9977	0.9946	0.9929	0.9962	1.0040	1.0154	1.0184	1.0219	1.0090	1.0081
183--------	1.0029	0.9977	0.9977	0.9946	0.9929	0.9962	1.0040	1.0154	1.0184	1.0219	1.0090	1.0081
184--------	1.0029	0.9977	0.9977	0.9945	0.9929	0.9962	1.0040	1.0154	1.0184	1.0219	1.0090	1.0081
185--------	1.0029	0.9977	0.9977	0.9945	0.9929	0.9962	1.0040	1.0154	1.0184	1.0218	1.0090	1.0081
186--------	1.0029	0.9977	0.9976	0.9945	0.9929	0.9961	1.0040	1.0154	1.0184	1.0218	1.0090	1.0080
187--------	1.0029	0.9977	0.9976	0.9945	0.9928	0.9961	1.0040	1.0154	1.0184	1.0218	1.0090	1.0080
188--------	1.0029	0.9977	0.9976	0.9945	0.9928	0.9961	1.0040	1.0154	1.0184	1.0218	1.0090	1.0080
189--------	1.0037	0.9985	0.9984	0.9953	0.9936	0.9969	1.0048	1.0162	1.0192	1.0226	1.0098	1.0088
190--------	1.0036	0.9985	0.9984	0.9953	0.9936	0.9969	1.0048	1.0162	1.0192	1.0226	1.0098	1.0088
191--------	1.0036	0.9984	0.9984	0.9953	0.9936	0.9969	1.0047	1.0161	1.0192	1.0226	1.0098	1.0088
192--------	1.0036	0.9984	0.9984	0.9953	0.9936	0.9969	1.0047	1.0161	1.0191	1.0226	1.0098	1.0088
193--------	1.0036	0.9984	0.9984	0.9952	0.9936	0.9969	1.0047	1.0161	1.0191	1.0226	1.0097	1.0088
194--------	1.0036	0.9984	0.9984	0.9952	0.9936	0.9969	1.0047	1.0161	1.0191	1.0226	1.0097	1.0088
195--------	1.0036	0.9984	0.9983	0.9952	0.9936	0.9968	1.0047	1.0161	1.0191	1.0226	1.0097	1.0087
196--------	1.0036	0.9984	0.9983	0.9952	0.9935	0.9968	1.0047	1.0161	1.0191	1.0225	1.0097	1.0087
197--------	1.0036	0.9984	0.9983	0.9952	0.9935	0.9968	1.0047	1.0161	1.0191	1.0225	1.0097	1.0087
198--------	1.0043	0.9991	0.9991	0.9960	0.9943	0.9976	1.0055	1.0169	1.0199	1.0233	1.0105	1.0095
199--------	1.0043	0.9991	0.9991	0.9960	0.9943	0.9976	1.0054	1.0168	1.0199	1.0233	1.0105	1.0095
200--------	1.0043	0.9991	0.9991	0.9959	0.9943	0.9976	1.0054	1.0168	1.0198	1.0233	1.0104	1.0095

TABLE 5.--RATIOS OF PROTEIN TO FAT THAT ARE TO BE MULTIPLIED BY REGIONAL AGE AND MONTH-OF-CALVING FAT FACTORS TO DERIVE ADJUSTMENT FACTORS FOR PROTEIN IN HOLSTEINS

AGE (MONTHS)	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
18--------	0.8974	0.9002	0.8993	0.8966	0.8985	0.8917	0.8951	0.8977	0.9029	0.9076	0.9131	0.9141
19--------	0.9235	0.9264	0.9255	0.9227	0.9247	0.9177	0.9212	0.9238	0.9292	0.9340	0.9397	0.9407
20--------	0.9490	0.9520	0.9510	0.9482	0.9502	0.9430	0.9466	0.9493	0.9548	0.9598	0.9657	0.9667
21--------	0.9733	0.9764	0.9754	0.9724	0.9745	0.9672	0.9708	0.9737	0.9793	0.9844	0.9904	0.9915
22--------	0.9966	0.9997	0.9987	0.9957	0.9978	0.9902	0.9940	0.9969	1.0027	1.0079	1.0140	1.0151
23--------	0.9772	0.9803	0.9793	0.9763	0.9784	0.9710	0.9747	0.9775	0.9832	0.9883	0.9943	0.9954
24--------	0.9751	0.9781	0.9771	0.9742	0.9763	0.9689	0.9726	0.9754	0.9811	0.9862	0.9922	0.9933
25--------	0.9798	0.9828	0.9818	0.9789	0.9810	0.9736	0.9773	0.9801	0.9858	0.9909	0.9969	0.9980
26--------	0.9839	0.9870	0.9860	0.9830	0.9851	0.9777	0.9814	0.9842	0.9899	0.9951	1.0012	1.0022
27--------	0.9882	0.9913	0.9903	0.9873	0.9894	0.9820	0.9857	0.9886	0.9943	0.9995	1.0055	1.0066
28--------	0.9919	0.9951	0.9941	0.9911	0.9932	0.9857	0.9894	0.9923	0.9980	1.0032	1.0093	1.0104
29--------	0.9966	0.9998	0.9988	0.9957	0.9979	0.9903	0.9941	0.9970	1.0028	1.0080	1.0141	1.0152
30--------	0.9974	1.0006	0.9996	0.9966	0.9987	0.9911	0.9949	0.9978	1.0036	1.0088	1.0149	1.0160
31--------	0.9958	0.9990	0.9980	0.9949	0.9971	0.9895	0.9933	0.9962	1.0020	1.0072	1.0133	1.0144
32--------	0.9894	0.9925	0.9915	0.9885	0.9906	0.9831	0.9869	0.9897	0.9955	1.0006	1.0067	1.0078
33--------	0.9804	0.9835	0.9825	0.9795	0.9816	0.9742	0.9779	0.9808	0.9864	0.9916	0.9976	0.9987
34--------	0.9762	0.9793	0.9783	0.9753	0.9774	0.9700	0.9737	0.9765	0.9822	0.9873	0.9933	0.9944
35--------	0.9752	0.9782	0.9772	0.9743	0.9764	0.9690	0.9727	0.9755	0.9812	0.9863	0.9923	0.9933
36--------	0.9758	0.9788	0.9778	0.9749	0.9770	0.9696	0.9733	0.9761	0.9817	0.9869	0.9929	0.9939
37--------	0.9764	0.9794	0.9784	0.9755	0.9776	0.9702	0.9739	0.9767	0.9824	0.9875	0.9935	0.9946
38--------	0.9778	0.9809	0.9799	0.9770	0.9791	0.9717	0.9754	0.9782	0.9838	0.9890	0.9950	0.9961
39--------	0.9794	0.9824	0.9814	0.9785	0.9806	0.9732	0.9769	0.9797	0.9854	0.9905	0.9965	0.9976
40--------	0.9801	0.9831	0.9821	0.9792	0.9813	0.9739	0.9776	0.9804	0.9861	0.9912	0.9972	0.9983
41--------	0.9826	0.9857	0.9847	0.9817	0.9838	0.9764	0.9801	0.9829	0.9886	0.9938	0.9998	1.0009
42--------	0.9843	0.9873	0.9864	0.9834	0.9855	0.9780	0.9818	0.9846	0.9903	0.9955	1.0015	1.0026
43--------	0.9851	0.9882	0.9872	0.9842	0.9863	0.9788	0.9826	0.9854	0.9911	0.9963	1.0024	1.0034
44--------	0.9868	0.9899	0.9889	0.9859	0.9880	0.9806	0.9843	0.9871	0.9929	0.9980	1.0041	1.0052
45--------	0.9876	0.9907	0.9897	0.9868	0.9889	0.9814	0.9851	0.9880	0.9937	0.9989	1.0050	1.0061
46--------	0.9894	0.9925	0.9915	0.9885	0.9907	0.9832	0.9869	0.9898	0.9955	1.0007	1.0068	1.0079
47--------	0.9912	0.9943	0.9933	0.9903	0.9925	0.9850	0.9887	0.9916	0.9973	1.0025	1.0086	1.0097
48--------	0.9921	0.9952	0.9942	0.9912	0.9934	0.9859	0.9896	0.9925	0.9982	1.0034	1.0095	1.0106
49--------	0.9921	0.9952	0.9942	0.9912	0.9934	0.9858	0.9896	0.9925	0.9982	1.0034	1.0095	1.0106
50--------	0.9930	0.9961	0.9951	0.9921	0.9943	0.9867	0.9905	0.9934	0.9991	1.0043	1.0105	1.0115
51--------	0.9940	0.9971	0.9961	0.9931	0.9952	0.9877	0.9914	0.9943	1.0001	1.0053	1.0114	1.0125
52--------	0.9949	0.9980	0.9970	0.9940	0.9961	0.9886	0.9924	0.9952	1.0010	1.0062	1.0123	1.0134
53--------	0.9958	0.9990	0.9980	0.9949	0.9971	0.9895	0.9933	0.9962	1.0020	1.0072	1.0133	1.0144
54--------	0.9968	0.9999	0.9989	0.9959	0.9980	0.9905	0.9943	0.9971	1.0029	1.0081	1.0143	1.0154
55--------	0.9978	1.0009	0.9999	0.9969	0.9990	0.9914	0.9952	0.9981	1.0039	1.0091	1.0153	1.0164
56--------	0.9987	1.0019	1.0008	0.9978	1.0000	0.9924	0.9962	0.9991	1.0049	1.0101	1.0162	1.0173
57--------	0.9997	1.0028	1.0018	0.9988	1.0009	0.9934	0.9972	1.0000	1.0058	1.0111	1.0172	1.0183
58--------	0.9987	1.0019	1.0009	0.9978	1.0000	0.9924	0.9962	0.9991	1.0049	1.0101	1.0163	1.0174
59--------	0.9987	1.0019	1.0009	0.9978	1.0000	0.9924	0.9962	0.9991	1.0049	1.0101	1.0163	1.0174
60--------	0.9997	1.0029	1.0018	0.9988	1.0010	0.9934	0.9972	1.0001	1.0059	1.0111	1.0173	1.0184
61--------	0.9997	1.0029	1.0018	0.9988	1.0010	0.9934	0.9972	1.0001	1.0059	1.0111	1.0173	1.0184
62--------	0.9997	1.0029	1.0019	0.9988	1.0010	0.9934	0.9972	1.0001	1.0059	1.0111	1.0173	1.0184
63--------	1.0007	1.0039	1.0028	0.9998	1.0020	0.9944	0.9982	1.0011	1.0069	1.0121	1.0183	1.0194
64--------	1.0007	1.0039	1.0029	0.9998	1.0020	0.9944	0.9982	1.0011	1.0069	1.0121	1.0183	1.0194
65--------	1.0007	1.0039	1.0029	0.9998	1.0020	0.9944	0.9982	1.0011	1.0069	1.0121	1.0183	1.0194
66--------	1.0017	1.0049	1.0039	1.0008	1.0030	0.9954	0.9992	1.0021	1.0079	1.0131	1.0193	1.0204
67--------	1.0017	1.0049	1.0039	1.0008	1.0030	0.9954	0.9992	1.0021	1.0079	1.0131	1.0193	1.0204
68--------	1.0007	1.0039	1.0029	0.9999	1.0020	0.9944	0.9982	1.0011	1.0069	1.0121	1.0183	1.0194
69--------	1.0007	1.0039	1.0029	0.9999	1.0020	0.9944	0.9982	1.0011	1.0069	1.0121	1.0183	1.0194
70--------	0.9998	1.0029	1.0019	0.9989	1.0010	0.9934	0.9972	1.0001	1.0059	1.0111	1.0173	1.0184
71--------	0.9988	1.0019	1.0009	0.9979	1.0000	0.9925	0.9962	0.9991	1.0049	1.0101	1.0163	1.0174
72--------	0.9998	1.0029	1.0019	0.9989	1.0010	0.9934	0.9972	1.0001	1.0059	1.0111	1.0173	1.0184
73--------	0.9988	1.0019	1.0009	0.9979	1.0000	0.9925	0.9962	0.9991	1.0049	1.0101	1.0163	1.0174
74--------	0.9998	1.0029	1.0019	0.9989	1.0010	0.9934	0.9972	1.0001	1.0059	1.0111	1.0173	1.0184
75--------	1.0017	1.0049	1.0038	1.0008	1.0030	0.9954	0.9992	1.0021	1.0079	1.0131	1.0193	1.0204
76--------	1.0027	1.0058	1.0048	1.0018	1.0039	0.9963	1.0001	1.0030	1.0089	1.0141	1.0203	1.0214
77--------	1.0037	1.0068	1.0058	1.0028	1.0049	0.9973	1.0011	1.0040	1.0098	1.0151	1.0213	1.0224
78--------	1.0047	1.0078	1.0068	1.0038	1.0059	0.9983	1.0021	1.0050	1.0108	1.0161	1.0223	1.0234
79--------	1.0027	1.0059	1.0049	1.0018	1.0040	0.9964	1.0002	1.0031	1.0089	1.0141	1.0203	1.0214
80--------	0.9998	1.0029	1.0019	0.9989	1.0010	0.9935	0.9972	1.0001	1.0059	1.0112	1.0173	1.0184
81--------	0.9978	1.0010	0.9999	0.9969	0.9991	0.9915	0.9953	0.9982	1.0040	1.0092	1.0153	1.0164
82--------	0.9958	0.9990	0.9980	0.9949	0.9971	0.9895	0.9933	0.9962	1.0020	1.0072	1.0133	1.0144
83--------	0.9988	1.0020	1.0009	0.9979	1.0001	0.9925	0.9963	0.9992	1.0050	1.0102	1.0163	1.0174
84--------	1.0018	1.0050	1.0039	1.0009	1.0031	0.9955	0.9993	1.0022	1.0080	1.0132	1.0194	1.0205
85--------	1.0048	1.0079	1.0069	1.0039	1.0060	0.9984	1.0022	1.0051	1.0110	1.0162	1.0224	1.0235
86--------	1.0047	1.0079	1.0068	1.0038	1.0060	0.9983	1.0021	1.0051	1.0109	1.0161	1.0223	1.0234
87--------	1.0056	1.0087	1.0077	1.0047	1.0068	0.9992	1.0030	1.0059	1.0118	1.0170	1.0232	1.0243
88--------	1.0065	1.0096	1.0086	1.0056	1.0077	1.0001	1.0039	1.0068	1.0126	1.0179	1.0241	1.0252
89--------	1.0045	1.0077	1.0067	1.0036	1.0058	0.9982	1.0020	1.0049	1.0107	1.0160	1.0221	1.0232
90--------	1.0007	1.0038	1.0028	0.9998	1.0019	0.9943	0.9981	1.0010	1.0068	1.0121	1.0182	1.0193
91--------	0.9968	0.9999	0.9989	0.9959	0.9981	0.9905	0.9943	0.9972	1.0029	1.0082	1.0143	1.0154
92--------	0.9939	0.9970	0.9960	0.9930	0.9951	0.9876	0.9914	0.9942	1.0000	1.0052	1.0113	1.0124
93--------	0.9900	0.9931	0.9921	0.9891	0.9912	0.9837	0.9875	0.9903	0.9961	1.0012	1.0073	1.0084
94--------	0.9900	0.9931	0.9921	0.9891	0.9912	0.9837	0.9875	0.9903	0.9961	1.0012	1.0073	1.0084
95--------	0.9900	0.9931	0.9921	0.9891	0.9912	0.9837	0.9875	0.9903	0.9961	1.0013	1.0073	1.0084
96--------	0.9910	0.9941	0.9931	0.9901	0.9922	0.9847	0.9885	0.9913	0.9971	1.0023	1.0084	1.0094
97--------	0.9920	0.9951	0.9941	0.9911	0.9932	0.9857	0.9894	0.9923	0.9981	1.0032	1.0094	1.0105
98--------	0.9929	0.9961	0.9950	0.9921	0.9942	0.9867	0.9904	0.9933	0.9990	1.0042	1.0104	1.0114
99--------	0.9939	0.9970	0.9960	0.9930	0.9951	0.9876	0.9914	0.9943	1.0000	1.0052	1.0113	1.0124
100--------	0.9949	0.9980	0.9970	0.9940	0.9961	0.9886	0.9923	0.9952	1.0010	1.0062	1.0123	1.0134
101--------	0.9958	0.9990	0.9980	0.9949	0.9971	0.9895	0.9933	0.9962	1.0020	1.0072	1.0133	1.0144
102--------	0.9968	0.9999	0.9989	0.9959	0.9980	0.9905	0.9943	0.9971	1.0029	1.0081	1.0143	1.0154
103--------	0.9977	1.0009	0.9999	0.9969	0.9990	0.9914	0.9952	0.9981	1.0039	1.0091	1.0152	1.0163
104--------	0.9996	1.0028	1.0018	0.9987	1.0009	0.9933	0.9971	1.0000	1.0058	1.0110	1.0172	1.0183
105--------	1.0006	1.0037	1.0027	0.9997	1.0018	0.9942	0.9980	1.0009	1.0067	1.0120	1.0181	1.0192
106--------	1.0015	1.0046	1.0036	1.0006	1.0028	0.9952	0.9990	1.0019	1.0077	1.0129	1.0191	1.0202
107--------	1.0015	1.0046	1.0036	1.0006	1.0027	0.9952	0.9989	1.0018	1.0076	1.0129	1.0191	1.0202
108--------	1.0015	1.0046	1.0036	1.0006	1.0027	0.9951	0.9989	1.0018	1.0076	1.0129	1.0191	1.0202
109--------	1.0015	1.0046	1.0036	1.0006	1.0027	0.9951	0.9989	1.0018	1.0076	1.0129	1.0190	1.0201

TABLE 5.--CONTINUED

AGE (MONTHS)	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
110	1.0015	1.0046	1.0036	1.0006	1.0027	0.9951	0.9989	1.0018	1.0076	1.0129	1.0190	1.0201
111	1.0015	1.0046	1.0036	1.0006	1.0027	0.9951	0.9989	1.0018	1.0076	1.0129	1.0190	1.0201
112	1.0014	1.0046	1.0036	1.0006	1.0027	0.9951	0.9989	1.0018	1.0076	1.0128	1.0190	1.0201
113	1.0014	1.0046	1.0036	1.0005	1.0027	0.9951	0.9989	1.0018	1.0076	1.0128	1.0190	1.0201
114	1.0014	1.0046	1.0036	1.0005	1.0027	0.9951	0.9989	1.0018	1.0076	1.0128	1.0190	1.0201
115	1.0014	1.0046	1.0035	1.0005	1.0027	0.9951	0.9989	1.0018	1.0076	1.0128	1.0190	1.0201
116	1.0014	1.0046	1.0035	1.0005	1.0027	0.9951	0.9989	1.0018	1.0076	1.0128	1.0190	1.0201
117	1.0014	1.0045	1.0035	1.0005	1.0027	0.9951	0.9989	1.0017	1.0076	1.0128	1.0190	1.0201
118	1.0014	1.0045	1.0035	1.0005	1.0026	0.9951	0.9988	1.0017	1.0075	1.0128	1.0190	1.0201
119	1.0014	1.0045	1.0035	1.0005	1.0026	0.9950	0.9988	1.0017	1.0075	1.0128	1.0189	1.0200
120	1.0023	1.0054	1.0044	1.0014	1.0035	0.9960	0.9998	1.0026	1.0085	1.0137	1.0199	1.0210
121	1.0014	1.0045	1.0035	1.0005	1.0026	0.9950	0.9988	1.0017	1.0075	1.0128	1.0189	1.0200
122	1.0014	1.0045	1.0035	1.0005	1.0026	0.9950	0.9988	1.0017	1.0075	1.0128	1.0189	1.0200
123	1.0013	1.0045	1.0035	1.0005	1.0026	0.9950	0.9988	1.0017	1.0075	1.0127	1.0189	1.0200
124	1.0013	1.0045	1.0035	1.0004	1.0026	0.9950	0.9988	1.0017	1.0075	1.0127	1.0189	1.0200
125	1.0022	1.0054	1.0044	1.0014	1.0035	0.9959	0.9997	1.0026	1.0084	1.0137	1.0198	1.0209
126	1.0013	1.0045	1.0034	1.0004	1.0026	0.9950	0.9988	1.0017	1.0075	1.0127	1.0189	1.0200
127	1.0013	1.0045	1.0034	1.0004	1.0026	0.9950	0.9988	1.0017	1.0075	1.0127	1.0189	1.0200
128	1.0013	1.0044	1.0034	1.0004	1.0025	0.9950	0.9988	1.0016	1.0075	1.0127	1.0189	1.0200
129	1.0013	1.0044	1.0034	1.0004	1.0025	0.9950	0.9987	1.0016	1.0074	1.0127	1.0189	1.0200
130	1.0022	1.0053	1.0043	1.0013	1.0034	0.9958	0.9996	1.0025	1.0084	1.0136	1.0198	1.0209
131	1.0022	1.0053	1.0043	1.0013	1.0034	0.9958	0.9996	1.0025	1.0083	1.0136	1.0198	1.0209
132	1.0022	1.0053	1.0043	1.0013	1.0034	0.9958	0.9996	1.0025	1.0083	1.0136	1.0197	1.0208
133	1.0031	1.0062	1.0052	1.0022	1.0043	0.9967	1.0005	1.0034	1.0092	1.0145	1.0206	1.0218
134	1.0030	1.0062	1.0052	1.0021	1.0043	0.9967	1.0005	1.0034	1.0092	1.0145	1.0206	1.0217
135	1.0039	1.0071	1.0061	1.0030	1.0052	0.9976	1.0014	1.0043	1.0101	1.0153	1.0215	1.0226
136	1.0039	1.0070	1.0060	1.0030	1.0051	0.9975	1.0013	1.0042	1.0101	1.0153	1.0215	1.0226
137	1.0039	1.0070	1.0060	1.0030	1.0051	0.9975	1.0013	1.0042	1.0100	1.0153	1.0215	1.0226
138	1.0048	1.0079	1.0069	1.0039	1.0060	0.9984	1.0022	1.0051	1.0109	1.0162	1.0224	1.0235
139	1.0047	1.0079	1.0069	1.0038	1.0060	0.9984	1.0022	1.0051	1.0109	1.0162	1.0224	1.0235
140	1.0047	1.0079	1.0068	1.0038	1.0060	0.9983	1.0022	1.0051	1.0109	1.0161	1.0223	1.0234
141	1.0056	1.0087	1.0077	1.0047	1.0068	0.9992	1.0030	1.0059	1.0118	1.0170	1.0232	1.0243
142	1.0055	1.0087	1.0077	1.0047	1.0068	0.9992	1.0030	1.0059	1.0117	1.0170	1.0232	1.0243
143	1.0064	1.0096	1.0086	1.0055	1.0077	1.0000	1.0039	1.0068	1.0126	1.0179	1.0241	1.0252
144	1.0064	1.0095	1.0085	1.0055	1.0076	1.0000	1.0038	1.0067	1.0126	1.0178	1.0240	1.0251
145	1.0064	1.0095	1.0085	1.0055	1.0076	1.0000	1.0038	1.0067	1.0125	1.0178	1.0240	1.0251
146	1.0072	1.0104	1.0093	1.0063	1.0085	1.0008	1.0046	1.0076	1.0134	1.0187	1.0249	1.0260
147	1.0081	1.0112	1.0102	1.0072	1.0093	1.0017	1.0055	1.0084	1.0142	1.0195	1.0257	1.0268
148	1.0080	1.0112	1.0102	1.0071	1.0093	1.0016	1.0055	1.0084	1.0142	1.0195	1.0257	1.0268
149	1.0080	1.0112	1.0101	1.0071	1.0092	1.0016	1.0054	1.0083	1.0142	1.0195	1.0257	1.0268
150	1.0080	1.0111	1.0101	1.0071	1.0092	1.0016	1.0054	1.0083	1.0142	1.0194	1.0256	1.0268
151	1.0097	1.0128	1.0118	1.0088	1.0109	1.0033	1.0071	1.0100	1.0159	1.0212	1.0274	1.0285
152	1.0096	1.0128	1.0118	1.0087	1.0109	1.0032	1.0071	1.0100	1.0158	1.0211	1.0273	1.0285
153	1.0096	1.0128	1.0117	1.0087	1.0109	1.0032	1.0070	1.0099	1.0158	1.0211	1.0273	1.0284
154	1.0104	1.0136	1.0126	1.0095	1.0117	1.0040	1.0079	1.0108	1.0166	1.0219	1.0281	1.0293
155	1.0113	1.0144	1.0134	1.0103	1.0125	1.0048	1.0087	1.0116	1.0175	1.0228	1.0290	1.0301
156	1.0112	1.0144	1.0134	1.0103	1.0125	1.0048	1.0086	1.0116	1.0174	1.0227	1.0289	1.0301
157	1.0120	1.0152	1.0142	1.0111	1.0133	1.0056	1.0095	1.0124	1.0182	1.0235	1.0298	1.0309
158	1.0120	1.0152	1.0141	1.0111	1.0132	1.0056	1.0094	1.0123	1.0182	1.0235	1.0297	1.0308
159	1.0128	1.0160	1.0149	1.0119	1.0141	1.0064	1.0102	1.0131	1.0190	1.0243	1.0306	1.0317
160	1.0127	1.0159	1.0149	1.0118	1.0140	1.0063	1.0102	1.0131	1.0190	1.0243	1.0305	1.0316
161	1.0135	1.0167	1.0157	1.0126	1.0148	1.0071	1.0110	1.0139	1.0198	1.0251	1.0313	1.0324
162	1.0135	1.0167	1.0157	1.0126	1.0148	1.0071	1.0109	1.0139	1.0197	1.0250	1.0313	1.0324
163	1.0143	1.0175	1.0165	1.0134	1.0156	1.0079	1.0117	1.0146	1.0205	1.0258	1.0321	1.0332
164	1.0142	1.0174	1.0164	1.0133	1.0155	1.0078	1.0117	1.0146	1.0205	1.0258	1.0320	1.0332
165	1.0150	1.0182	1.0172	1.0141	1.0163	1.0086	1.0125	1.0154	1.0213	1.0266	1.0328	1.0340
166	1.0158	1.0190	1.0180	1.0149	1.0171	1.0094	1.0133	1.0162	1.0221	1.0274	1.0337	1.0348
167	1.0166	1.0198	1.0188	1.0157	1.0179	1.0102	1.0140	1.0170	1.0229	1.0282	1.0345	1.0356
168	1.0157	1.0189	1.0179	1.0148	1.0170	1.0093	1.0131	1.0161	1.0220	1.0273	1.0335	1.0347
169	1.0165	1.0197	1.0187	1.0156	1.0178	1.0101	1.0139	1.0169	1.0227	1.0281	1.0343	1.0354
170	1.0173	1.0205	1.0194	1.0164	1.0185	1.0108	1.0147	1.0176	1.0235	1.0288	1.0351	1.0362
171	1.0172	1.0204	1.0194	1.0163	1.0185	1.0108	1.0146	1.0176	1.0235	1.0288	1.0351	1.0362
172	1.0180	1.0212	1.0201	1.0171	1.0193	1.0115	1.0154	1.0183	1.0242	1.0296	1.0358	1.0370
173	1.0187	1.0219	1.0209	1.0178	1.0200	1.0123	1.0162	1.0191	1.0250	1.0303	1.0366	1.0377
174	1.0187	1.0219	1.0209	1.0178	1.0200	1.0122	1.0161	1.0190	1.0250	1.0303	1.0366	1.0377
175	1.0195	1.0227	1.0216	1.0185	1.0207	1.0130	1.0169	1.0198	1.0257	1.0311	1.0373	1.0385
176	1.0202	1.0234	1.0224	1.0193	1.0215	1.0137	1.0176	1.0206	1.0265	1.0318	1.0381	1.0392
177	1.0210	1.0242	1.0231	1.0200	1.0222	1.0145	1.0184	1.0213	1.0272	1.0326	1.0389	1.0400
178	1.0217	1.0249	1.0239	1.0208	1.0230	1.0152	1.0191	1.0221	1.0280	1.0333	1.0396	1.0408
179	1.0208	1.0240	1.0230	1.0199	1.0221	1.0144	1.0182	1.0212	1.0271	1.0324	1.0387	1.0398
180	1.0216	1.0248	1.0237	1.0206	1.0228	1.0151	1.0190	1.0219	1.0278	1.0332	1.0395	1.0406
181	1.0223	1.0255	1.0245	1.0214	1.0236	1.0158	1.0197	1.0227	1.0286	1.0339	1.0402	1.0414
182	1.0230	1.0262	1.0252	1.0221	1.0243	1.0166	1.0204	1.0234	1.0293	1.0347	1.0410	1.0421
183	1.0229	1.0262	1.0251	1.0220	1.0242	1.0165	1.0203	1.0233	1.0292	1.0346	1.0409	1.0420
184	1.0237	1.0269	1.0259	1.0228	1.0250	1.0172	1.0211	1.0240	1.0300	1.0353	1.0416	1.0428
185	1.0244	1.0276	1.0266	1.0235	1.0257	1.0179	1.0218	1.0248	1.0307	1.0361	1.0424	1.0435
186	1.0251	1.0283	1.0273	1.0242	1.0264	1.0186	1.0225	1.0255	1.0314	1.0368	1.0431	1.0442
187	1.0250	1.0283	1.0272	1.0241	1.0263	1.0185	1.0224	1.0254	1.0313	1.0367	1.0430	1.0441
188	1.0258	1.0290	1.0279	1.0248	1.0270	1.0193	1.0231	1.0261	1.0321	1.0374	1.0437	1.0449
189	1.0265	1.0297	1.0286	1.0256	1.0277	1.0200	1.0239	1.0268	1.0328	1.0381	1.0445	1.0456
190	1.0264	1.0296	1.0286	1.0255	1.0276	1.0199	1.0238	1.0267	1.0327	1.0381	1.0444	1.0455
191	1.0279	1.0311	1.0300	1.0269	1.0291	1.0214	1.0252	1.0282	1.0342	1.0396	1.0459	1.0470
192	1.0278	1.0310	1.0299	1.0268	1.0290	1.0213	1.0251	1.0281	1.0341	1.0395	1.0458	1.0469
193	1.0285	1.0317	1.0306	1.0275	1.0297	1.0220	1.0258	1.0288	1.0348	1.0402	1.0465	1.0476
194	1.0284	1.0316	1.0305	1.0274	1.0296	1.0219	1.0257	1.0287	1.0347	1.0401	1.0464	1.0475
195	1.0298	1.0331	1.0320	1.0289	1.0311	1.0233	1.0272	1.0302	1.0362	1.0416	1.0479	1.0490
196	1.0305	1.0338	1.0327	1.0296	1.0318	1.0240	1.0279	1.0309	1.0369	1.0423	1.0486	1.0497
197	1.0304	1.0336	1.0326	1.0295	1.0317	1.0239	1.0278	1.0308	1.0367	1.0421	1.0485	1.0496
198	1.0311	1.0343	1.0333	1.0302	1.0324	1.0246	1.0285	1.0315	1.0374	1.0428	1.0492	1.0503
199	1.0318	1.0350	1.0340	1.0308	1.0330	1.0252	1.0291	1.0321	1.0381	1.0435	1.0499	1.0510
200	1.0316	1.0349	1.0338	1.0307	1.0329	1.0251	1.0290	1.0320	1.0380	1.0434	1.0497	1.0509

An Economic Index for Use in Selecting Bulls Evaluated on Protein or Solids-Not-Fat

H. D. Norman

An economic index (Predicted Difference (PD) dollars) was added to USDA-DHIA Sire Summaries and Cow Indexes in 1971 to combine the relative value of milk and milk fat for purposes of ranking bulls and cows (10). This index for gross income over breed average was developed because the product value of most milk produced was dependent on both the quantity and its milk fat content. Previously bulls and cows were ranked most frequently on the basis of transmitting abilities for milk yield, but sometimes they were ranked for fat yield. The economic index provided an opportunity for an economic advantage to dairymen using PD dollars compared to those selecting strictly on PD milk or PD fat. Since its introduction, the term PD dollars has been used widely by artificial insemination organizations in bull culling and advertising. It has been used directly in ranking bulls in Hoard's Dairyman (2), breed journals, and extension publications. It has also been used in calculating the "best buys in semen" lists, recently made available by several extension dairymen. The acceptance of PD and Cow Index (CI) dollars in sire and cow selection instead of PD and CI milk has helped reduce the decline in component percentages. Nevertheless, continuing declines in percentages are likely in the next 5 years because of the transmitting abilities of bulls currently being utilized.

When PD dollars was introduced in 1971, there was little demand for component information and limited interest in genetic improvement of components. There were only a few areas of the country where components other than fat were included in the milk-pricing formulas. Little information was available for direct genetic improvement in these components. Now that sire evaluations are available for protein and solids-not-fat (SNF), a measure of economic merit is needed for use where there is payment for these components and genetic improvement is desired.

An economic index reflecting value of product is beneficial in that it simplifies multitrait selection among bulls of the same breed and optimizes economic gain. As more traits of economic importance are considered, the value of such an index increases. Even though the yield of protein is correlated with milk and milk fat yield, the lack of a perfect correlation means that additional improvement can be made. Cumulative differences become important for increasing yields of specific components over a period of time. Therefore simultaneous selection for milk, fat, and protein (or SNF) is necessary for maximum economic progress, even though the gain in each trait will be less than maximum.

In 1971, PD dollars was calculated from PD milk and PD fat with formulas corresponding to those used to pay most dairymen for yield of milk and fat. The new economic index presented is similar to the previous one for milk and fat but it contains one additional component, the transmitting ability of protein or SNF (see appendix). This index incorporates transmitting abilities into the pricing formula I believe will most likely be used in the future in payment for protein or SNF, allowing for a differential for another component in addition to the present differential for fat. An index for product income could be expanded likewise to include additional differentials for lactose or minerals if these components were included in the payment formulas. The indices defined in the appendix contain fat and protein differentials. SNF was substituted for protein with a base test of 8.5 percent for use in the SNF sire summaries.

Selecting appropriate differentials was not easy because there is little uniformity in component pricing. A few processors operating under a fat-protein pricing formula believe the differentials, or premiums, presently being used are transitional and will increase in the future. A knowledge of the price relationships among milk, fat, and protein (or SNF) that will be in use 10 years hence would be most helpful in this effort.

Several ways have been proposed for determining valid differentials for protein or SNF. The one most frequently suggested is to relate the differential to the value of nonfat dry milk powder. The average price of powder in 1978 was 71 cents per pound (13). Another alternative is to determine the value of a percent change in component within each type of utilization (fluid use, cheese, powder, etc.) and then weight the values in relation to the percentage of milk going into these various uses in the United States. The latter alternative could be outlined as follows:

Utilization	Total milk (percent)	Suggested SNF differential for each utilization (cents)
Fluid milk sales	50	2.0 (0-6)
Cheese	25	18.0 (15-21)
Powder	10	6.7 (7.1 minus 5% loss in processing)
Other uses	15	7.1
Total or weighted average	100	7.2

This alternative provides a value similar to that of the nonfat dry milk.

The standard formula (10) will be used to calculate PD dollars from estimated transmitting abilities for milk and fat from the component data. Then, product value based on milk, fat, and the component of interest will be calculated from the same data (appendix, equation 2). The difference in the two estimates (PD dollars from milk, fat, and component minus PD dollars from milk and fat only) will be added to the Modified Contemporary Comparison estimate of PD dollars to produce the estimate published.

The new index should not be considered a replacement for Modified Contemporary Comparison (MCC) PD dollars because for most bulls there are no evaluations for protein or SNF, and most milk produced is still price dependent on milk yield and fat percentage only. The index should be used by dairymen presently receiving payment for protein or anticipating such payment within the next 5 years.

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Appendix

The formula for computing expected gross income from milk produced under a fat-protein pricing by the daughters of a specific bull or cow is as follows:

Equation 1

$$I = (BA_m + TA_m) \times [P - (D_f \times T_{bf}) - (D_p \times T_{bp})] + [(BA_f + TA_f) \times (D_f \times 100)] + [(BA_p + TA_p) \times (D_p \times 100)]$$

where:

I is the expected total income for milk produced in a 305-day, 2X, mature equivalent lactation.

BA_m, BA_f, and BA_p are the breed averages associated with the genetic bases in units for milk, fat, and protein yield, respectively.

TA_m, TA_f, and TA_p are the genetic transmitting abilities in units for milk, fat, and protein, respectively. If the offspring of a bull are being considered, PD for milk is used for TA_m. If the daughters of a cow are being considered, CI for milk is used for TA_m, etc.

P is the price paid for a unit of milk at the base test for fat and protein.

D_f is the fat test differential or the change in value of a unit of milk for each change of 1 percent in fat test.

D_p is the protein test differential or the change in value of a unit of milk for each change of 1 percent in the protein test.

T_{bf} is the base test for fat in percent.

T_{bp} is the base test for protein in percent.

Example 1:

The expected gross income for milk produced by daughters of Holstein bull A with a PD for milk of +1,200 pounds, a PD for fat of +40 pounds, and a PD for protein of +30 pounds is to be calculated using the following information:

BA_m = 14,118 pounds

BA_f = 513 pounds

BA_p = 444 pounds

P = \$0.104 per pound (obtained from \$10.40 per hundredweight)

D_f = \$0.0128 per percent per pound (obtained from \$0.128 per 0.1 percent per hundredweight)

D_p = \$0.0094 per percent per pound (obtained from \$0.094 per 0.1 percent per hundredweight)

T_{bf} = 3.5 percent

T_{bp} = 3.2 percent

Since the bull's PD for milk, fat, and protein are used for TA_m, TA_f, and TA_p, then $TA_m = 1{,}200$ pounds, $TA_f = 40$ pounds, and $TA_p = 30$ pounds.

The index formula from equation 1 with measurements in pounds is solved as follows:

$$I = (BA_m + TA_m) \times [P - (D_f \times T_{bf}) - (D_p \times T_{bp})] + [(BA_f + TA_f) \times (D_f \times 100)] + [(BA_p + TA_p) \times (D_p \times 100)]$$

$$I = (14{,}118 + 1{,}200) \times [\$0.104 - (\$0.0128 \times 3.5) - (\$0.0094 \times 3.2)] + [(513 + 40) \times (\$0.0128 \times 100)] + [(444 + 30) \times (\$0.0094 \times 100)]$$

$$I = (15{,}318 \times \$0.02912) + (553 \times \$1.28) + (474 \times \$0.94)$$

$$I = \$446.06 + \$707.84 + \$445.56$$

$$I = \$1{,}599.46$$

Therefore the expected gross income from daughters of bull A averages \$1,599.46 under this pricing system.

The formula for computing expected income for the daughters of a specific bull relative to the daughters of a breed average bull under fat-protein pricing is as follows:

Equation 2

$$V = TA_m \times [P - (D_f \times T_{bf}) - (D_p \times T_{bp})] + [TA_f \times (D_f \times 100)] + [TA_p \times (D_p \times 100)]$$

where:

V is the expected total value for milk produced expressed as a deviation from the average income for the breed.

TA_m, P, D_f, T_{bf}, D_p, T_{bp}, TA_f, and TA_p are the same as defined previously.

Example 2:

Let us compute deviation income from breed average for a bull's daughters according to the following pricing system: The milk price is \$10.40 per hundredweight for 3.5 percent test or P = \$0.104 per pound. The test differential for fat is \$0.128 per 0.1 percent deviation from base per hundredweight or D_f = \$0.0128 per percent per pound; the test differential for protein is \$0.094 per 0.1 percent deviation from base per hundredweight or D_p = 0.0094 per percent per pound (i.e., milk with 0 fat and protein is worth \$2.91 per hundredweight).

From equation 2:

$$V = TA_m \times [P - (D_f \times T_{bf}) - (D_p \times T_{bp})] + [TA_f \times (D_f \times 100)] + [TA_p \times (D_p \times 100)]$$

$$V = TA_m \times [\$0.104 - (\$0.0128 \times 3.5) - (\$0.0094 \times 3.2)]$$
$$+ [TA_f \times (\$0.0128 \times 100)] + [TA_p \times (\$0.0094 \times 100)]$$

$$V = (TA_m \times \$0.02912) + (TA_f \times \$1.28)$$
$$+ (TA_p \times \$0.94)$$

This reduced equation simply indicates that the transmitting ability for milk, fat, and protein will be multiplied, respectively, by the value of a unit of 0 percent milk, a unit of fat, and a unit of protein.

Index bull A:

Bull A has a PD milk of +1,200 pounds, a PD fat of +40 pounds, and a PD protein of +30 pounds.

$$V = (1{,}200 \times \$0.02912) + (40 \times \$1.28) + (30 \times \$0.94)$$

$$V = \$34.94 + \$51.20 + \$28.20$$

$$V = \$114.34$$

Therefore under this pricing system, daughters of bull A would be expected to average \$114.34 more gross income per lactation than their breed average herdmates.

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