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|--|---|
| <b>COUNTRY'S NAME</b>  | <b>SOUTH AFRICA</b>   |
| <b>Production traits</b>   | <b>Milk, fat and protein</b>  |
| <b>Breed</b>   | Holstein, Jersey, Ayrshire, Guernsey  |
| <b>Trait definition and unit of measurement</b>                      | Direct: Milk, fat and protein yield (kg), calculated from test-day values over lactation. Protein % and Fat % determined by single or combined sample.  |
| <b>Criteria for inclusion &amp; extension of records</b>             | All first lactations within range of 17 to 39 months of age at first calving are considered. Only normally terminated completed lactation records of between 240-300days are used. No extension.  |
| <b>Time period for data inclusion</b>                                | Records: Cows calving since 1978.<br>Pedigree: no restriction.  |
| <b>Sire categories</b>   | All sires are evaluated, categories identified are:<br>Holstein: AI (2561), NS (2897), Proven sires (1561), Young sires (1069)<br>Jersey: AI (673), NS (2370), Proven sires (557), Young sires (241)<br>Ayrshire: AI (275), NS (403), Proven sires (118), Young sires (90)<br>Guernsey: AI (148), NS (286), Proven sires (78), Young sires (45) |
| <b>Number of lactations included in the evaluation</b>               | One   |
| <b>Environmental effects: Pre-adjustment</b>                         | None  |
| <b>Base for age pre-adjustment</b>                                   |   |
| <b>Method (model) of genetic evaluation</b>                          | Holstein, Jersey , Guernsey: MT – SL – BLUP – AM<br>Ayrshire: ST – SL – BLUP – AM   |
| <b>Environmental effects in the genetic evaluation model</b>         | Age at calving (6 Levels), Lactation year x Herd x Status (HOL: 21034 Levels; JER: 7678 Levels; AYR: 1323 Levels; GUE: 824 Levels)  |
| <b>Use of genetic groups</b>   | Relationship matrix modified by genetic groups based on missing pedigree. Groups based on Country of origin (four groups: South Africa, North America, Europe and Australia/New Zealand), year (5 year groups), and selection path (sire of sire, sire of dam, dam of sire and dam of dam).   |
| <b>Genetic parameters in the evaluation</b>                          | Please see Appendix I   |
| <b>System validation</b>   | Data checks and validations on quality before genetic evaluation based on outlier detection, duplicates and pedigree checks. Trend validation based on DYDs (Interbull Method II and III). Correlate previous EBVs with latest and follow up big deviations.  |
| <b>Expression of genetic evaluations</b>                             | EBV in unit of measurement  |
| <b>Genetic (reference) base</b>                                      | Lactation year of all cows, currently at 1995.  |
| <b>Next base change</b>  | Next base year change in May 2005 to 2000.  |
| <b>Criteria for official publication of evaluations</b>              | Minimum number of 9 daughters and 5 herds   |
| <b>Number of evaluations / publications per year</b>                 | 2 Evaluations; May and November   |
| <b>Use in production / total merit index</b>                         | None globally used. Production and Type indexes employed by Holstein and Jersey societies.  |
| <b>Anticipated changes in the near future</b>                        | Inclusion of genetic (phantom) groups and extension to MT for Ayrshire (November 2001)  |
| <b>Key reference on methodology applied</b>                          | Boichard. D., et al., 1995 J. Dairy Sci. 78:431-437<br>Groeneveld. E., 1990. PEST User's manual. Univ Illinois.<br>Groeneveld. E. & Garcia Cortes. A., 1998. Proc 6 <sup>th</sup> WCGAPL. 27:455-456  |
| <b>Key organization: name, address, phone, fax, e-mail, web site</b> | ARC-Animal Improvement Institute<br>Private Bag X2 IRENE 0062 South Africa<br>Tel +27 – 12 - 6729069<br>Fax +27 – 12 – 6651419<br>Email <a href="mailto:japie@iapi.agric.za">japie@iapi.agric.za</a><br>Web <a href="http://www.arc.agric.za/lnr/institutes/aii/aiicore.htm">www.arc.agric.za/lnr/institutes/aii/aiicore.htm</a>                |

## Appendix I

### Genetic parameters in the evaluation

#### HOLSTEIN (MT – SL – BLUP – AM)

|                                     | Milk       | Butterfat            | Protein                         |
|-------------------------------------|------------|----------------------|---------------------------------|
| Residual variance                   | 621741.121 | 18286.119<br>834.338 | 18039.378<br>563.567<br>572.194 |
| Variance: Sire X Herd               | 38676.866  | 1159.771<br>44.708   | 1129.708<br>34.027<br>35.010    |
| Additive animal variance            | 356016.213 | 8685.318<br>399.719  | 9252.111<br>276.969<br>299.571  |
| Heritability & Genetic correlations | 0.350      | 0.728<br>0.313       | 0.896<br>0.800<br>0.330         |

#### JERSEY (MT – SL – BLUP – AM)

|                          | Milk       | Butterfat            | Protein                        |
|--------------------------|------------|----------------------|--------------------------------|
| Residual variance        | 298378.695 | 11305.821<br>577.169 | 9728.032<br>393.031<br>351.911 |
| Variance: Sire X Herd    | 29761.709  | 1108.825<br>54.468   | 969.166<br>39.931<br>34.692    |
| Additive animal variance | 139309.319 | 4520.658<br>230.844  | 4296.771<br>176.355<br>161.877 |
| Heritability             | 0.298      | 0.797<br>0.268       | 0.905<br>0.912<br>0.295        |

#### AYRSHIRE (ST – SL – BLUP – AM)

|                          | Milk     | Butterfat | Protein |
|--------------------------|----------|-----------|---------|
| Residual variance        | 412829.6 | 575.7     | 460.8   |
| Variance: Sire X Herd    | 22279.6  | 40.2      | 29.2    |
| Additive animal variance | 223577.8 | 277.7     | 218.4   |
| Heritability             | 0.339    | 0.311     | 0.308   |

#### GUERNSEY (ST – SL – BLUP – AM)

|                          | Milk     | Butterfat | Protein |
|--------------------------|----------|-----------|---------|
| Residual variance        | 309475.0 | 557.7     | 381.2   |
| Variance: Sire X Herd    | 18272.4  | 34.0      | 27.5    |
| Additive animal variance | 172579.1 | 205.1     | 146.0   |
| Heritability             | 0.345    | 0.257     | 0.263   |

| COUNTRY:   |    |         |        |       |       |         |       |        |       |           |       |
|--|----|---------|--------|-------|-------|---------|-------|--------|-------|-----------|-------|
| Number of AI bulls (NB) tested, means (X), and standard deviations (SD) of proofs (kg, %) from most recent run, by bulls' year of birth (YB) and breed (The average proofs are calculated from all bulls). |    |         |        |       |       |         |       |        |       |           |       |
| YB   | NB | Milk    |        | Fat   |       | Protein |       | Fat %  |       | Protein % |       |
|  |    | X       | SD     | X     | SD    | X       | SD    | X      | SD    | X         | SD    |
| Breed Holstein   |    |         |        |       |       |         |       |        |       |           |       |
| 1985   | 42 | 94.89   | 389.74 | 6.58  | 10.87 | 3.73    | 9.11  | 0.058  | 0.189 | 0.017     | 0.111 |
| 1986   | 35 | 36.64   | 333.24 | 4.26  | 11.59 | 2.19    | 9.45  | 0.051  | 0.170 | 0.019     | 0.096 |
| 1987   | 30 | 218.25  | 357.82 | 9.61  | 7.82  | 8.97    | 9.25  | 0.036  | 0.153 | 0.036     | 0.088 |
| 1988   | 48 | 322.52  | 350.52 | 11.42 | 9.67  | 10.20   | 9.06  | 0.006  | 0.173 | 0.005     | 0.105 |
| 1989   | 47 | 379.03  | 415.41 | 14.71 | 11.03 | 13.02   | 11.48 | 0.027  | 0.180 | 0.021     | 0.078 |
| 1990   | 34 | 470.33  | 383.53 | 15.37 | 11.16 | 16.43   | 11.11 | -0.014 | 0.162 | 0.028     | 0.078 |
| 1991   | 43 | 621.82  | 375.50 | 16.91 | 13.18 | 20.24   | 11.09 | -0.073 | 0.111 | 0.015     | 0.090 |
| 1992   | 39 | 596.54  | 408.08 | 17.57 | 11.45 | 23.07   | 10.71 | -0.047 | 0.144 | 0.069     | 0.088 |
| 1993   | 32 | 753.19  | 353.78 | 25.87 | 13.88 | 26.02   | 11.97 | -0.010 | 0.131 | 0.037     | 0.086 |
| 1994   | 41 | 835.98  | 417.27 | 26.23 | 12.38 | 27.21   | 11.55 | -0.042 | 0.173 | 0.019     | 0.072 |
| 1995   | 24 | 1093.0  | 369.25 | 31.51 | 11.41 | 36.36   | 11.25 | -0.096 | 0.105 | 0.031     | 0.097 |
| Breed Jersey   |    |         |        |       |       |         |       |        |       |           |       |
| 1985   | 11 | 11.91   | 257.62 | 2.94  | 10.19 | 1.52    | 7.16  | 0.066  | 0.243 | 0.032     | 0.147 |
| 1986   | 7  | 33.84   | 271.51 | 3.36  | 8.15  | 1.47    | 6.99  | 0.053  | 0.192 | 0.011     | 0.106 |
| 1987   | 18 | 172.35  | 343.20 | 8.83  | 9.66  | 7.24    | 9.67  | 0.040  | 0.204 | 0.030     | 0.111 |
| 1988   | 17 | 217.23  | 256.10 | 15.18 | 7.35  | 9.42    | 7.96  | 0.135  | 0.187 | 0.040     | 0.107 |
| 1989   | 9  | 323.52  | 239.30 | 15.71 | 7.67  | 13.59   | 7.50  | 0.039  | 0.240 | 0.047     | 0.136 |
| 1990   | 3  | 495.83  | 461.51 | 21.80 | 5.27  | 18.17   | 6.13  | 0.018  | 0.352 | 0.023     | 0.254 |
| 1991   | 8  | 327.99  | 190.96 | 15.26 | 6.52  | 12.49   | 4.65  | 0.018  | 0.221 | 0.021     | 0.100 |
| 1992   | 13 | 483.65  | 339.01 | 20.10 | 12.45 | 18.25   | 10.24 | 0.022  | 0.176 | -0.024    | 0.104 |
| 1993   | 10 | 619.38  | 190.20 | 23.35 | 7.74  | 18.61   | 6.61  | -0.082 | 0.248 | -0.077    | 0.114 |
| 1994   | 8  | 597.15  | 451.96 | 21.99 | 17.99 | 19.20   | 13.72 | -0.089 | 0.180 | -0.049    | 0.104 |
| 1995   | 5  | 733.10  | 276.48 | 33.18 | 9.90  | 32.60   | 7.08  | 0.015  | 0.100 | 0.130     | 0.071 |
| 1996   | 13 | 836.22  | 305.12 | 38.12 | 6.39  | 34.62   | 7.79  | 0.032  | 0.253 | 0.095     | 0.086 |
| Breed Ayrshire   |    |         |        |       |       |         |       |        |       |           |       |
| 1985   | 2  | -68.15  | 142.91 | -3.65 | 0.92  | -4.45   | 0.50  | -0.018 | 0.122 | -0.041    | 0.099 |
| 1986   | 3  | -104.9  | 163.86 | -6.87 | 5.55  | -3.23   | 5.42  | -0.055 | 0.056 | 0.005     | 0.065 |
| 1987   | -  | -       | -      | -     | -     | -       | -     | -      | -     | -         | -     |
| 1988   | 4  | 215.38  | 155.13 | 8.93  | 8.16  | 5.98    | 3.10  | 0.013  | 0.140 | -0.021    | 0.038 |
| 1989   | 2  | -168.8  | 68.73  | -7.70 | 1.41  | -5.75   | 5.87  | -0.024 | 0.023 | -0.003    | 0.070 |
| 1990   | 1  | 347.4   | -      | 11.60 | -     | 6.40    | -     | -0.030 | -     | -0.091    | -     |
| 1991   | -  | -       | -      | -     | -     | -       | -     | -      | -     | -         | -     |
| 1992   | 2  | 71.15   | 600.26 | -0.15 | 18.03 | -1.60   | 13.72 | -0.049 | 0.087 | -0.068    | 0.108 |
| 1993   | 2  | 480.70  | 440.53 | 14.95 | 7.85  | 11.30   | 12.30 | -0.054 | 0.152 | -0.079    | 0.034 |
| 1994   | 2  | 177.35  | 869.10 | 7.40  | 27.86 | 2.55    | 21.28 | 0.019  | 0.102 | -0.051    | 0.130 |
| 1995   | -  | -       | -      | -     | -     | -       | -     | -      | -     | -         | -     |
| Breed Guernsey   |    |         |        |       |       |         |       |        |       |           |       |
| 1985   | 3  | 297.47  | 122.97 | 8.30  | 1.35  | 6.67    | 4.15  | -0.094 | 0.108 | -0.073    | 0.059 |
| 1986   | 3  | -170.77 | 258.02 | -4.53 | 11.94 | -4.70   | 10.28 | 0.066  | 0.039 | 0.025     | 0.049 |
| 1987   | 5  | 124.82  | 420.59 | 3.40  | 7.34  | 3.31    | 9.36  | -0.026 | 0.247 | -0.013    | 0.112 |
| 1988   | 1  | 333.80  | -      | 17.00 | -     | 13.50   | -     | 0.052  | -     | 0.043     | -     |
| 1989   | -  | -       | -      | -     | -     | -       | -     | -      | -     | -         | -     |
| 1990   | 1  | 192.00  | -      | 4.80  | -     | 4.90    | -     | -0.075 | -     | -0.036    | -     |
| 1991   | -  | -       | -      | -     | -     | -       | -     | -      | -     | -         | -     |
| 1992   | -  | -       | -      | -     | -     | -       | -     | -      | -     | -         | -     |
| 1993   | -  | -       | -      | -     | -     | -       | -     | -      | -     | -         | -     |
| 1994   | -  | -       | -      | -     | -     | -       | -     | -      | -     | -         | -     |
| 1995   | 1  | 724.50  | -      | 17.60 | -     | 17.60   | -     | -0.265 | -     | -0.138    | -     |

| COUNTRY:  |       |         |         |        |       |         |       |       |       |           |       |
|---|-------|---------|---------|--------|-------|---------|-------|-------|-------|-----------|-------|
| Average of adjusted production records (kg, %) included in the most recent evaluation run, by daughters' year of calving (YC), number of cows (NC) and breed. |       |         |         |        |       |         |       |       |       |           |       |
| YC  | NC    | Milk    |         | Fat    |       | Protein |       | Fat % |       | Protein % |       |
|   |       | X       | SD      | X      | SD    | X       | SD    | X     | SD    | X         | SD    |
| Breed   |       |         |         |        |       |         |       |       |       |           |       |
| Holstein  |       |         |         |        |       |         |       |       |       |           |       |
| 1984  | 10539 | 4466.29 | 1204.92 | 147.37 | 40.27 | 160.51  | 43.00 | 3.61  | 0.366 | 3.30      | 0.191 |
| 1985  | 11667 | 4550.63 | 1237.04 | 150.35 | 41.63 | 163.33  | 43.54 | 3.61  | 0.365 | 3.30      | 0.181 |
| 1986  | 14413 | 4596.81 | 1294.00 | 148.79 | 42.75 | 165.70  | 45.92 | 3.62  | 0.370 | 3.24      | 0.186 |
| 1987  | 15653 | 4630.67 | 1350.77 | 148.15 | 43.67 | 165.69  | 47.54 | 3.60  | 0.370 | 3.20      | 0.192 |
| 1988  | 18292 | 4784.87 | 1388.47 | 155.58 | 45.70 | 170.08  | 47.91 | 3.58  | 0.369 | 3.25      | 0.204 |
| 1989  | 20309 | 5084.41 | 1450.45 | 164.81 | 47.06 | 179.19  | 49.54 | 3.55  | 0.381 | 3.25      | 0.204 |
| 1990  | 21553 | 5237.51 | 1450.61 | 169.79 | 47.18 | 183.97  | 50.62 | 3.53  | 0.370 | 3.25      | 0.200 |
| 1991  | 22116 | 5475.34 | 1494.35 | 177.62 | 48.95 | 191.64  | 51.66 | 3.52  | 0.370 | 3.25      | 0.203 |
| 1992  | 21880 | 5564.15 | 1587.33 | 177.12 | 50.94 | 195.21  | 54.86 | 3.53  | 0.383 | 3.19      | 0.198 |
| 1993  | 23935 | 5770.40 | 1653.09 | 183.66 | 54.10 | 202.24  | 57.60 | 3.53  | 0.388 | 3.18      | 0.204 |
| 1994  | 24309 | 5947.42 | 1616.48 | 185.73 | 51.31 | 207.83  | 56.00 | 3.52  | 0.381 | 3.13      | 0.195 |
| 1995  | 26324 | 6230.75 | 1777.19 | 193.95 | 55.90 | 219.10  | 61.55 | 3.54  | 0.387 | 3.12      | 0.191 |
| 1996  | 24991 | 6507.70 | 1809.18 | 203.39 | 57.08 | 230.18  | 66.82 | 3.55  | 0.416 | 3.13      | 0.187 |
| 1997  | 25306 | 6311.83 | 1830.15 | 196.21 | 57.07 | 222.56  | 69.69 | 3.53  | 0.439 | 3.11      | 0.189 |
| 1998  | 24246 | 6745.42 | 1958.88 | 214.38 | 62.22 | 237.79  | 74.12 | 3.53  | 0.365 | 3.18      | 0.189 |
| 1999  | 25402 | 6908.00 | 1987.25 | 212.88 | 60.88 | 240.57  | 75.92 | 3.48  | 0.372 | 3.09      | 0.179 |
| 2000  | 21867 | 6935.50 | 2044.30 | 214.59 | 63.46 | 243.16  | 79.99 | 3.50  | 0.383 | 3.10      | 0.180 |
| Breed   |       |         |         |        |       |         |       |       |       |           |       |
| Jersey  |       |         |         |        |       |         |       |       |       |           |       |
| 1984  | 2056  | 3215.09 | 850.76  | 122.93 | 32.60 | 146.56  | 38.45 | 4.58  | 0.467 | 3.83      | 0.260 |
| 1985  | 2441  | 3274.02 | 844.04  | 123.47 | 31.92 | 148.28  | 38.32 | 4.55  | 0.468 | 3.78      | 0.252 |
| 1986  | 2857  | 3258.02 | 836.62  | 120.58 | 31.87 | 147.35  | 38.01 | 4.54  | 0.451 | 3.70      | 0.256 |
| 1987  | 3155  | 3311.64 | 875.38  | 123.67 | 33.58 | 149.73  | 40.22 | 4.54  | 0.445 | 3.73      | 0.257 |
| 1988  | 3764  | 3419.11 | 865.06  | 130.66 | 33.76 | 154.63  | 40.08 | 4.53  | 0.444 | 3.82      | 0.259 |
| 1989  | 4359  | 3556.29 | 900.90  | 134.70 | 34.09 | 159.68  | 40.95 | 4.51  | 0.459 | 3.80      | 0.247 |
| 1990  | 4519  | 3691.81 | 903.76  | 140.28 | 34.50 | 165.66  | 41.26 | 4.50  | 0.454 | 3.81      | 0.251 |
| 1991  | 4815  | 3752.49 | 947.75  | 141.62 | 36.36 | 165.67  | 44.18 | 4.42  | 0.469 | 3.78      | 0.265 |
| 1992  | 5059  | 3804.92 | 978.04  | 140.79 | 36.96 | 169.95  | 46.11 | 4.48  | 0.471 | 3.70      | 0.250 |
| 1993  | 5565  | 3916.30 | 1015.84 | 145.14 | 37.71 | 174.37  | 46.74 | 4.47  | 0.454 | 3.71      | 0.248 |
| 1994  | 6427  | 4015.17 | 993.21  | 145.16 | 36.15 | 178.02  | 45.52 | 4.45  | 0.460 | 3.62      | 0.245 |
| 1995  | 7128  | 4118.94 | 1098.63 | 148.05 | 38.79 | 182.10  | 48.49 | 4.45  | 0.468 | 3.61      | 0.239 |
| 1996  | 8354  | 4226.39 | 1091.63 | 152.14 | 38.52 | 188.25  | 49.69 | 4.47  | 0.467 | 3.61      | 0.232 |
| 1997  | 8357  | 4179.43 | 1050.67 | 149.30 | 37.36 | 187.26  | 48.97 | 4.50  | 0.480 | 3.58      | 0.223 |
| 1998  | 8673  | 4673.38 | 1087.85 | 159.00 | 39.50 | 200.14  | 50.85 | 4.58  | 0.399 | 3.64      | 0.233 |
| 1999  | 9881  | 4512.11 | 1122.76 | 159.57 | 39.65 | 206.13  | 52.15 | 4.58  | 0.419 | 3.54      | 0.230 |
| 2000  | 9542  | 4399.42 | 1080.37 | 156.21 | 39.58 | 199.35  | 52.57 | 4.54  | 0.500 | 3.55      | 0.237 |
| Breed   |       |         |         |        |       |         |       |       |       |           |       |
| Ayrshire  |       |         |         |        |       |         |       |       |       |           |       |
| 1984  | 525   | 4054.92 | 1052.36 | 139.52 | 36.51 | 151.30  | 38.14 | 3.755 | 0.357 | 3.44      | 0.209 |
| 1985  | 566   | 3912.79 | 1046.68 | 134.53 | 35.64 | 149.25  | 39.86 | 3.83  | 0.351 | 3.45      | 0.194 |
| 1986  | 735   | 4007.33 | 1051.11 | 136.17 | 35.88 | 151.59  | 39.54 | 3.80  | 0.319 | 3.40      | 0.206 |
| 1987  | 802   | 3969.70 | 1042.49 | 134.86 | 35.82 | 150.49  | 38.37 | 3.81  | 0.328 | 3.40      | 0.208 |
| 1988  | 969   | 3973.57 | 1053.11 | 136.94 | 37.05 | 149.81  | 40.02 | 3.78  | 0.327 | 3.45      | 0.213 |
| 1989  | 993   | 4195.98 | 1090.71 | 145.51 | 37.72 | 157.82  | 39.88 | 3.78  | 0.326 | 3.48      | 0.210 |
| 1990  | 959   | 4332.41 | 1092.29 | 150.47 | 38.23 | 162.03  | 40.03 | 3.76  | 0.330 | 3.48      | 0.218 |
| 1991  | 927   | 4563.17 | 1205.00 | 158.22 | 43.00 | 170.53  | 44.18 | 3.76  | 0.328 | 3.47      | 0.217 |
| 1992  | 919   | 4590.37 | 1270.78 | 156.87 | 44.77 | 173.86  | 48.60 | 3.80  | 0.384 | 3.42      | 0.215 |
| 1993  | 916   | 5008.72 | 1427.81 | 169.78 | 49.95 | 189.93  | 55.10 | 3.80  | 0.330 | 3.39      | 0.199 |
| 1994  | 1010  | 5142.56 | 1383.08 | 171.98 | 47.54 | 193.02  | 52.04 | 3.77  | 0.357 | 3.34      | 0.202 |
| 1995  | 1032  | 5284.14 | 1631.46 | 175.43 | 55.36 | 200.80  | 59.53 | 3.83  | 0.362 | 3.32      | 0.184 |
| 1996  | 993   | 5563.78 | 1691.12 | 183.16 | 54.82 | 211.79  | 63.65 | 3.83  | 0.405 | 3.30      | 0.194 |
| 1997  | 984   | 5548.45 | 1626.88 | 181.34 | 52.90 | 210.14  | 66.78 | 3.79  | 0.416 | 3.28      | 0.180 |
| 1998  | 947   | 5666.47 | 1852.11 | 188.57 | 61.74 | 217.73  | 77.13 | 3.83  | 0.332 | 3.33      | 0.189 |
| 1999  | 1175  | 5921.53 | 1940.00 | 189.55 | 60.65 | 226.30  | 79.89 | 3.81  | 0.307 | 3.21      | 0.173 |
| 2000  | 973   | 6222.16 | 1885.31 | 201.01 | 60.42 | 238.02  | 73.86 | 3.83  | 0.279 | 3.24      | 0.173 |

| Breed |     | Guernsey |         |        |       |        |       |      |       |      |       |
|-------|-----|----------|---------|--------|-------|--------|-------|------|-------|------|-------|
| 1984  | 339 | 3539.62  | 875.70  | 127.15 | 32.48 | 150.37 | 39.46 | 4.26 | 0.452 | 3.59 | 0.230 |
| 1985  | 429 | 3695.72  | 890.16  | 132.22 | 31.29 | 157.04 | 37.51 | 4.27 | 0.444 | 3.59 | 0.225 |
| 1986  | 425 | 3687.69  | 967.49  | 129.46 | 34.80 | 157.33 | 41.59 | 4.29 | 0.471 | 3.51 | 0.251 |
| 1987  | 453 | 3696.94  | 905.32  | 128.51 | 30.72 | 155.10 | 37.02 | 4.22 | 0.447 | 3.49 | 0.227 |
| 1988  | 573 | 3556.51  | 803.86  | 126.50 | 28.79 | 151.05 | 36.31 | 4.25 | 0.427 | 3.56 | 0.229 |
| 1989  | 494 | 3661.29  | 923.05  | 128.85 | 32.63 | 153.92 | 37.92 | 4.23 | 0.416 | 3.53 | 0.244 |
| 1990  | 509 | 3823.16  | 879.01  | 134.83 | 33.06 | 162.10 | 38.98 | 4.25 | 0.395 | 3.53 | 0.255 |
| 1991  | 448 | 4006.40  | 990.80  | 141.23 | 36.10 | 168.65 | 42.87 | 4.23 | 0.416 | 3.53 | 0.264 |
| 1992  | 417 | 4104.29  | 974.29  | 142.22 | 35.94 | 174.85 | 44.13 | 4.27 | 0.414 | 3.46 | 0.249 |
| 1993  | 398 | 4323.66  | 1010.37 | 151.70 | 35.71 | 184.74 | 43.95 | 4.29 | 0.395 | 3.51 | 0.219 |
| 1994  | 468 | 4618.46  | 1135.96 | 160.02 | 38.93 | 196.71 | 49.18 | 4.27 | 0.390 | 3.47 | 0.209 |
| 1995  | 490 | 4507.38  | 1159.10 | 153.90 | 39.32 | 194.75 | 49.84 | 4.34 | 0.420 | 3.42 | 0.227 |
| 1996  | 439 | 4539.25  | 1157.96 | 154.79 | 38.65 | 196.18 | 53.28 | 4.33 | 0.458 | 3.42 | 0.210 |
| 1997  | 406 | 4394.78  | 1210.78 | 149.14 | 41.98 | 191.12 | 55.19 | 4.35 | 0.474 | 3.40 | 0.229 |
| 1998  | 430 | 4568.31  | 1248.15 | 156.64 | 43.17 | 201.50 | 58.61 | 4.41 | 0.400 | 3.44 | 0.238 |
| 1999  | 421 | 4688.72  | 1337.34 | 155.38 | 44.78 | 202.71 | 58.02 | 4.34 | 0.363 | 3.32 | 0.221 |
| 2000  | 345 | 4886.69  | 1501.61 | 163.34 | 50.19 | 209.59 | 63.17 | 4.31 | 0.344 | 3.35 | 0.212 |