**Supplementary Materials**

**Supplementary Table S1** shows the data on days to flowering, days to maturity, and yield (kg per ha) of the BC2F4 rice population.

| Line No. | Day to Flowering (Days) | Day to Maturity (days) | Yield (Kg per ha) |
| --- | --- | --- | --- |
| 10D04 | 112 | 135 | 4335 |
| 15B12 | 123 | 150 | 4271 |
| 14H08 | 121 | 139 | 3959 |
| 10E.02 | 127 | 153 | 3635 |
| 2G04 | 128 | 153 | 3527 |
| 6C11 | 110 | 131 | 3484 |
| 12A05 | 112 | 133 | 3360 |
| 8C12 | 118 | 146 | 3339 |
| 3C03 | 118 | 147 | 3325 |
| 14B10 | 110 | 139 | 3295 |
| 2D09 | 119 | 146 | 3256 |
| 8D10 | 122 | 150 | 3112 |
| 3E.05 | 112 | 139 | 3103 |
| 14F12 | 112 | 143 | 3090 |
| 15C05 | 119 | 146 | 3031 |
| 14A12 | 113 | 135 | 3013 |
| 15D02 | 116 | 146 | 2997 |
| 14A08 | 129 | 154 | 2865 |
| 9B09 | 112 | 135 | 2855 |
| 14E.01 | 114 | 133 | 2756 |
| 14E.12 | 110 | 139 | 2737 |
| 13A06 | 108 | 133 | 2604 |
| 10B09 | 127 | 151 | 2598 |
| 8G04 | 108 | 135 | 2551 |
| 9G04 | 121 | 149 | 2548 |
| 9D06 | 118 | 150 | 2543 |
| 7A02 | 112 | 135 | 2441 |
| 16B09 | 120 | 150 | 2408 |
| 14A04 | 123 | 153 | 2404 |
| 10A11 | 122 | 149 | 2387 |
| 14B01 | 113 | 135 | 2327 |
| 16H02 | 113 | 135 | 2316 |
| 14H03 | 131 | 156 | 2239 |
| 14A03 | 131 | 156 | 2187 |
| 10C01 | 122 | 153 | 2156 |
| 12D01 | 127 | 153 | 2099 |
| 10A01 | 118 | 133 | 2035 |
| 5B07 | 110 | 135 | 2025 |
| 9G01 | 123 | 153 | 1907 |
| 10G01 | 128 | 153 | 1863 |
| 15F02 | 112 | 131 | 1859 |
| 6D11 | 112 | 146 | 1853 |
| 4D02 | 112 | 139 | 1811 |
| 16E.03 | 116 | 145 | 1789 |
| 2G03 | 131 | 156 | 1726 |
| 5D03 | 135 | 158 | 1682 |
| 9E.03 | 108 | 133 | 1661 |
| 14F10 | 108 | 131 | 1648 |
| 7F09 | 133 | 156 | 1512 |
| 3E.07 | 127 | 153 | 1499 |
| 12B01 | 122 | 153 | 1334 |
| 8F01 | 106 | 131 | 1319 |
| 5B09 | 116 | 153 | 1280 |
| 8F03 | 110 | 131 | 1277 |
| 9B08 | 112 | 146 | 1064 |
| 8B12 | 135 | 156 | 933 |
| 9A04 | 133 | 156 | 909 |
| 5H03 | 108 | 139 | 847 |
| 9D02 | 127 | 156 | 677 |
| 5B06 | 102 | 127 | 673 |
| 5G06 | 99 | 129 | 614 |
| 4E.05 | 113 | 139 | 348 |

**Supplementary Table S2** Amylose content and rapidly available glucose (RAG) of cooked rice with low gelatinization temperature (GT)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Rice lines | GT | %Amylose content  (base on rice flour) | Rapidly available glucose at 20 mins  base on dry solid of cooked rice | | |
| 5B07 | Low | 10.52 | 88.0 | + | 2.1a |
| 9E03 | Low | 11.57 | 84.7 | + | 1.0abc |
| 16H02 | Low | 11.79 | 84.6 | + | 1.3abc |
| 5B06 | Low | 11.91 | 83.0 | + | 3.4bcd |
| 7A02 | Low | 12.57 | 81.7 | + | 1.8bcdef |
| 8F01 | Low | 12.59 | 84.1 | + | 1.5bcd |
| 14E01 | Low | 12.79 | 73.2 | + | 2.7jkl |
| 5G06 | Low | 13.05 | 71.5 | + | 2.0klm |
| 9A04 | Low | 13.08 | 77.4 | + | 2.8ghi |
| 14B01 | Low | 13.25 | 73.3 | + | 1.4jkl |
| 9B09 | Low | 13.69 | 71.2 | + | 0.5klm |
| 14A12 | Low | 13.86 | 69.2 | + | 2.5 m |
| 2D09 | Low | 13.88 | 78.7 | + | 3.1fgh |
| 14E02 | Low | 14.03 | 70.3 | + | 2.0lm |
| 12A05 | Low | 14.42 | 64.6 | + | 3.3n |
| 10A01 | Low | 14.46 | 79.2 | + | 0.4efgh |
| 14B10 | Low | 14.66 | 81.1 | + | 1.1cdef |
| 8G04 | Low | 14.76 | 80.6 | + | 1.5defg |
| 5H03 | Low | 14.88 | 82.6 | + | 0.1bcde |
| 10D04 | Low | 15.36 | 74.0 | + | 0.9ijk |
| 8B12 | Low | 15.61 | 72.3 | + | 0.8klm |
| 14H08 | Low | 15.78 | 82.9 | + | 1.1bcd |
| 6C11 | Low | 16.12 | 85.1 | + | 1.5ab |
| 13A06 | Low | 16.28 | 81.6 | + | 2.3bcdef |
| 4D02 | Low | 16.69 | 76.0 | + | 0.3hij |
| 15C05 | Low | 16.77 | 84.1 | + | 1.3bcd |
| 3E05 | Low | 19.26 | 69.7 | + | 1.4lm |
| 8C12 | Low | 19.50 | 82.3 | + | 2.3bcde |
| 8F03 | Low | 22.69 | 42.9 | + | 0.6o |
| 15D02 | Low | 24.37 | 37.8 | + | 0.9pq |
| 16B09 | Low | 25.34 | 26.8 | + | 1.6r |
| 16E03 | Low | 25.54 | 27.1 | + | 0.6r |
| 10B09 | Low | 26.02 | 36.2 | + | 1.5q |
| 117A08 | Low | 26.80 | 40.3 | + | 1.6op |

Results are the mean ± SD on a dry basis and expressed as the percentage of whole grain flour. Values with different letters in the same column significantly differ with p ≤ 0.05.

**Supplementary Table S3** Amylose content and rapidly available glucose (RAG) of cooked rice with high gelatinization temperature (GT)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Rice lines | GT | | %Amylose content  (base on rice flour) | Rapidly available glucose at 20 mins  base on dry solid of cooked rice | | |
| 6D11 | High | | 12.57 | 79.6 | + | 1.5a |
| 4E05 | High | | 13.61 | 58.5 | + | 3.4b |
| 9D02 | High | | 15.15 | 60.9 | + | 1.0b |
| 14F10 | High | | 21.55 | 31.5 | + | 0.0hi |
| 9G01 | High | | 23.25 | 26.0 | + | 0.0jklm |
| 12B01 | High | | 23.71 | 33.7 | + | 2.5fgh |
| 14A08 | High | | 23.93 | 37.7 | + | 1.2e |
| 3E07 | High | | 24.37 | 26.6 | + | 1.4jkl |
| 14F12 | High | | 24.42 | 33.2 | + | 2.3fgh |
| 3C03 | High | | 24.66 | 28.8 | + | 0.5ij |
| 12D01 | High | | 24.88 | 29.5 | + | 0.2ij |
| 14A03 | High | | 25.00 | 42.4 | + | 0.1d |
| 9D06 | High | | 25.61 | 36.5 | + | 3.0ef |
| 2G04 | High | | 25.80 | 33.2 | + | 0.2fgh |
| 14H03 | High | | 25.92 | 34.6 | + | 2.5efgh |
| 10A11 | High | | 26.02 | 25.0 | + | 1.7klm |
| 9B04 | High | | 26.34 | 28.5 | + | 0.3ijk |
| 5D03 | High | | 26.46 | 29.4 | + | 2.0ij |
| 5B09 | High | | 26.61 | 43.7 | + | 0.3d |
| 9B08 | High | | 26.63 | 31.7 | + | 3.5hi |
| 15F02 | High | | 26.80 | 43.9 | + | 0.1d |
| 10G01 | | High | 26.87 | 49.3 | + | 0.4c |
| 14A04 | | High | 27.07 | 35.4 | + | 1.0efg |
| 10C01 | | High | 27.77 | 44.7 | + | 2.6d |
| 10E02 | | High | 28.21 | 31.9 | + | 3.3ghi |
| 2G03 | | High | 28.55 | 22.9 | + | 2.3m |
| 15B12 | | High | 29.22 | 29.0 | + | 0.6ij |
| 8D10 | | High | 29.63 | 44.8 | + | 0.5d |
| 7F09 | | High | 29.74 | 23.6 | + | 1.6lm |

Results are the mean ± SD on a dry basis and expressed as the percentage of whole grain flour. Values with different letters in the same column significantly differ with p ≤ 0.05.

**Supplementary Table S4** Amylose content, rapidly available glucose, and slowly available glucose of cooked rice with low and high Gelatinization temperature

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Rice lines | GT | %Amylose content  (base on rice flour) | available glucose  base on dry solid of cooked rice | | | | | |
| Rapid available glucose at 20 mins | | | Slow available glucose at 120 mins | | |
| 12A05 | Low | 17.61 | 64.6 | + | 3.3b | 18.8 | + | 0.0f |
| 117A08 | Low | 28.86 | 40.3 | + | 1.6de | 36.1 | + | 1.6d |
| 8F03 | Low | 30.31 | 42.9 | + | 0.6d | 45.6 | + | 0.6ab |
| 15D02 | Low | 31.29 | 37.8 | + | 0.9e | 48.1 | + | 1.1a |
| 6D11 | High | 15.56 | 79.6 | + | 1.5a | 13.5 | + | 1.3g |
| 9D02 | High | 16.97 | 60.9 | + | 1.0c | 26.2 | + | 1.6e |
| 4\_E05 | High | 17.42 | 58.5 | + | 3.4c | 26.1 | + | 2.9e |
| 9G01 | High | 29.28 | 26.0 | + | 0.0i | 41.6 | + | 2.8c |
| 12B01 | High | 29.57 | 33.7 | + | 2.5f | 43.0 | + | 2.5bc |
| 12D01 | High | 29.72 | 29.5 | + | 0.2gh | 41.1 | + | 1.8c |
| 14A08 | High | 29.92 | 37.7 | + | 1.2e | 43.6 | + | 1.7bc |
| 14A03 | High | 29.97 | 42.4 | + | 0.1d | 35.6 | + | 3.0d |
| 3C03 | High | 30.23 | 28.8 | + | 0.5ghi | 43.6 | + | 1.0bc |
| 14F12 | High | 30.31 | 33.2 | + | 2.3f | 42.3 | + | 1.5bc |
| 3\_E07 | High | 30.34 | 26.6 | + | 1.4hi | 43.8 | + | 0.6bc |
| 14F10 | High | 30.74 | 31.5 | + | 0.0gh | 43.3 | + | 1.3bc |

Results are the mean ± SD on a dry basis and expressed as the percentage of whole grain flour. Values with different letters in the same column significantly differ with p ≤ 0.05.

A group of plates of rice

Description automatically generated

**Supplementary Figure S1** The whole-grain rice samples were cooked using a rice cooker with a rice-to-water ratio 1:2 and cooked for 30 to 40 minutes.

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**Supplementary Figure S2**Days to Flowering, Days to Maturity, and Yield of BC2F3 population.



**Supplementary Figure S3** The rate of starch digestion by amylase enzyme over varying incubation times (20 to 180 minutes) differs among cooked whole-grain rice varieties. The samples was prepared as freeze-dried (fine powder).