1．

Table S1 Comparison of ingredients between BC supplement powder and regular milk powder

|  |  |  |
| --- | --- | --- |
| Active Ingredients | BC supplement powder | Regular milk powder |
| Raw cow milk | √ | √ |
| Skim milk powder | √ | √ |
| lactose | √ | √ |
| Isomaltooligosaccharide | √ | √ |
| Bovine colostrum | √ |  |
| Hydrolyzed Whey Protein Peptide | √ |  |
| Animal Bifidobacterium Bb-12 | √ |  |
| Vitamin （A、C、D、E） | √ | √ |
| Folate | √ | √ |

Note. Both milk powders were produced by Heilongjiang Feihe ,China. Due to the privacy issue of the product formula, the specific proportion of ingredients cannot be provided.

2.

Table S2 Study Site Follow up Schedule

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Items** | **Time** | | | |
| **0 day** | **24th day** | **56th day** | **90th day** |
| Distribute milk powder | √ | √ | √ |  |
| Physical examination | √ |  |  | √ |
| Blood collection | √ |  |  | √ |
| Recycling empty milk powder bags |  | √ | √ | √ |
| Questionnaire investigation | √ |  | √ | √ |
| Salivary sampling | √ |  | √ | √ |

3.

Table S3 MET of different types of physical activity in IPAQ-LF

|  |  |  |  |
| --- | --- | --- | --- |
| Type | Program | Strength | MET |
| Work | High intensity | High | 8.0 |
| Moderate intensity | Moderate | 4.0 |
| Walking intensity | Low | 3.3 |
| Transportation | Cycling intensity | Moderate | 6.0 |
| Walking intensity | Low | 3.3 |
| Housework | High intensity | High | 5.5 |
| Moderate intensity | Moderate | 4.0 |
| Leisure time | High intensity | High | 8.0 |
| Moderate intensity | Moderate | 4.0 |
| Walking intensity | Low | 3.3 |

Note. High intensity physical activity is those that cause the breathing and heart rate to increase significantly, and moderate intensity physical activity is those that cause the breathing and heart rate to increase slightly.

4.

Table S4 Standards for Grouping Individual Physical Activity Levels

|  |  |
| --- | --- |
| Levels | Standards |
| High | Satisfy any of the following: |
| 1) The total amount of all types of high-intensity physical activity was ≥3 days, and the weekly total physical activity level was ≥1500 MET-min/w. |
| 2) Total physical activity of different intensity ≥7 days, and the weekly total physical activity level was ≥3000 MET-min/w. |
| Moderate | Satisfy any of the following: |
| 1) All kinds of high-intensity physical activities for at least 20 minutes per day, total ≥3 days. |
| 2) At least 30 minutes of moderate intensity and/or walking activities per day, total ≥5 days. |
| 3) Total physical activity of different intensity≥5 days, and the weekly total physical activity level was ≥600 MET-min/w. |
| Low | Satisfy any of the following: |
| 1) No activities were reported. |
| 2) Some activities were reported, but they did not yet meet the above moderate to high grouping criteria. |

5.

Table S5 Comparison of compliance at three follow-up visits (%)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Compliance | Day 24 | | Day 56 | | Day 90 | |
| Control | Intervention | Control | Intervention | Control | Intervention |
| High | 77（88.5） | 73（86.9） | 76（87.4） | 75（89.3） | 78（89.7） | 74（88.1） |
| Medium | 2（2.3） | 1（1.2） | 5（5.7） | 2（2.4） | 1（1.1） | 1（1.2） |
| Low | 5（5.7） | 5（6.0） | 4（4.6） | 4（4.8） | 3（3.4） | 5（6.0） |
| Deficiency | 3（3.4） | 5（6.0） | 2（2.3） | 3（3.6） | 5（5.7） | 4（4.8） |
| Total | 87 | 84 | 87 | 84 | 87 | 84 |
| *P* value | 0.618 | | 0.454 | | 0.752 | |

Note. Categorical variables are presented as counts (%). The *P* values refer to the between-group differences at the time points of day 0, day 56, and day 90.

6、

Table S6 Self-reported prevalence of chronic diseases (%)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Chronic Disease | Total  (n = 188) | Intervention  (n = 94) | Control  (n = 94) | *χ*2 | *P* |
| No chronic diseases | 116(61.7) | 58(61.7) | 58（61.7) | 0.000 | 1.000 |
| Hypertension | 43(22.9) | 20(21.3) | 23(24.5) | 0.333 | 0.602 |
| High blood lipids | 11(5.9) | 5(5.3) | 6(6.4) | 0.097 | 0.756 |
| Diabetes | 17(9.0) | 8(8.5) | 9(9.6) | 0.065 | 0.799 |
| Coronary heart disease | 9(4.8) | 5(5.3) | 4(4.3) | 0.117 | 0.678 |
| Others | 3(1.6) | 1(1.1) | 2(2.1) | 0.339 | 0.561 |

Note. Categorical variables are presented as counts (%).

7.

Table S7 Changes in self-reported health status during the intervention period (%)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Group/Parameter | | Day 0 | Day 56 | Day 90 | *χ*2 | *P* |
| **Bitter taste** | | | | | | |
| **Control group (N=82)** | | | | | 1.504 | 0.826 |
|  | never | 52(63.4) | 53(64.6) | 51(62.2) |  |  |
|  | sometimes | 24(29.3) | 20(24.4) | 25(30.5) |  |  |
|  | frequently | 6(7.3) | 9(11.0) | 6(7.3) |  |  |
| **Intervention group (N=83)** | | | | |  |  |
|  | never | 57(68.7) | 61(73.5) | 51(61.4) | 6.441 | 0.169 |
|  | sometimes | 22(26.5) | 14(16.9) | 19(22.9) |  |  |
|  | frequently | 4(4.8) | 8(9.6) | 13(15.7) |  |  |
| *χ*2 |  | 0.710 | 1.673 | 3.391 |  |  |
| *P* |  | 0.701 | 0.433 | 0.183 |  |  |
| **Fatigue** | | | | | | |
| **Control group (N=82)** | | | | | 3.044 | 0.550 |
|  | never | 57(69.5) | 59(72.0) | 55(67.1) |  |  |
|  | sometimes | 17(20.7) | 16(19.5) | 23(28.0) |  |  |
|  | frequently | 8(9.8) | 7(8.5) | 4(4.9) |  |  |
| **Intervention group (N=83)** | | | | |  |  |
|  | never | 60(72.3) | 67(80.7) | 67(80.7) | 3.389 | 0.495 |
|  | sometimes | 17(20.5) | 12(14.5) | 14(16.9) |  |  |
|  | frequently | 6(7.2) | 4(4.8) | 2(2.4) |  |  |
| *χ*2 |  | 0.357 | 1.892 | 4.030 |  |  |
| *P* |  | 0.837 | 0.388 | 0.133 |  |  |
| **Cold** | | | | | | |
| **Control group (N=82)** | | | | | 11.283 | 0.004 |
|  | Never | 72(87.8) | 64(78.0) | 54(65.9) |  |  |
|  | ≥ once in a month | 10(12.2) | 18(22.0) | 28(34.1) |  |  |
| **Intervention group (N=83)** | | | | | 2.919 | 0.232 |
|  | Never | 74(89.2) | 70(84.3) | 66(79.5) |  |  |
|  | ≥ once in a month | 9(10.8) | 13(15.7) | 17(20.5) |  |  |
| *χ*2 |  | 1.421 | 2.463 | 2.444 |  |  |
| *P* |  | 0.701 | 0.292 | 0.295 |  |  |
| **Diarrhea** | | | | | | |
| **Control group (N=82)** | | | | | 0.081 | 0.960 |
|  | Never | 73(89.0) | 72(87.8) | 73(89.0) |  |  |
|  | ≥ once in a month | 9(11.0) | 10(12.2) | 9(11.0) |  |  |
| **Intervention group (N=83)** | | | | |  |  |
|  | Never | 78(94.0) | 74(89.2) | 77(92.8) | 1.414 | 0.493 |
|  | ≥ once in a month | 5(6.0) | 9(10.8) | 6(7.2) |  |  |
| *χ*2 |  | 7.993 | 6.355 | 3.301 |  |  |
| *P* |  | 0.092 | 0.385 | 0.654 |  |  |
| **Frequency of bowel movements** | | | | | | |
| **Control group (N=82)** | | | | | 0.574 | 0.966 |
|  | 3-5 times/day | 3(3.7) | 2(2.4) | 2(2.4) |  |  |
|  | 1-2 times/day | 69(84.1) | 73(88.0) | 72(87.8) |  |  |
|  | 2-3 days/time | 10(12.2) | 8(9.6) | 8(9.8) |  |  |
| **Intervention group (N=83)** | | | | | 1.895 | 0.755 |
|  | 3-5 times/day | 2(2.4) | 1(1.2) | 1(1.2) |  |  |
|  | 1-2 times/day | 73(88.0) | 70(84.3) | 69(83.1) |  |  |
|  | 2-3 days/time | 8(9.6) | 12(14.5) | 13(15.7) |  |  |
| *χ*2 |  | 2.307 | 0.763 | 3.191 |  |  |
| *P* |  | 0.511 | 0.683 | 0.363 |  |  |

Note. Categorical variables are presented as counts (%).

8.

Table S8 Mean daily intakes of major nutrients for the participants

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Nutrient | Total(n = 168) | Intervention(n = 87) | Control(n = 81) | *Z* | *P* |
| Protein (g) | 46.50(33.88,61.21) | 47.15(37.27,62.52) | 46.04(31.06,59.64) | -1.255 | 0.209 |
| Fat(g) | 34.66(22.16,46.78) | 35.04(24.24,47.02) | 34.22(20.38,46.18) | -0.922 | 0.356 |
| Vitamin (A、C、D、E)(mg) | 43.01(26.66,69.61) | 45.61(31.11,74.58) | 42.17(23.76,64.40) | -1.465 | 0.143 |
| Minerals (mg) | 3138.88(2224.50,4020.61) | 3201.39(2326.61,4148.66) | 2985.83(2083.90,3910.09) | -1.128 | 0.259 |
| Folate (μg) | 186.99(143.62,256.77) | 196.30(153.41,254.06) | 177.25(141.18,271.14) | -1.005 | 0.315 |

Note. The data of non-normal distribution is expressed as the Median (IQR(Q1,Q3)).

9.

Table S9 Physical activity profile of the two groups in IPAQ (%)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time | High | | Moderate | | Low | | *Z* | *P* |
| Intervention | Control | Intervention | Control | Intervention | Control |
| Day 0 | 62(83.8) | 55(73.3) | 6(8.1) | 10(13.3) | 6(8.1) | 10(13.3) | 2.412 | 0.239 |
| Day 90 | 57(77) | 56(74.7) | 13(17.6) | 16(21.3) | 4(5.4) | 3(4.0) | 0.455 | 0.796 |

Note. High intensity physical activity is those that cause the breathing and heart rate to increase significantly. Moderate intensity physical activity is those that cause the breathing and heart rate to increase slightly, and low is walking intensity.