

Supplementary data:

Supplement 1. Fish biomass in tank (B), individual body weight (BW), total body length (TL and SL), coefficient of variation (CV), and condition factor (K) of *C. gariepinus* juveniles after 0 days of feeding with four experimental HS diets (HS0-HS6).

| Parameters | HS0 | HS1 | HS3 | HS6 | F^{test} | n | P |
|------------|---------------|---------------|---------------|---------------|---------------------|-------|-------|
| Period (d) | Day 0 | Day 0 | Day 0 | Day 0 | Day 0 | Day 0 | Day 0 |
| B (kg) | 2.88 ± 0.05 | 2.91 ± 0.14 | 2.98 ± 0.11 | 3.00 ± 0.05 | 1.92 ^{1WA} | 20 | 0.17 |
| BW (g) | 32.12 ± 2.06 | 31.47 ± 3.01 | 32.83 ± 1.30 | 33.09 ± 1.47 | 0.62 ^{1WA} | 20 | 0.61 |
| TL (mm) | 162.44 ± 3.61 | 161.23 ± 4.97 | 163.34 ± 2.61 | 162.79 ± 2.25 | 0.32 ^{1WA} | 20 | 0.81 |
| SL (mm) | 143.99 ± 3.70 | 143.98 ± 4.75 | 144.71 ± 2.54 | 144.57 ± 2.33 | 0.06 ^{1WA} | 20 | 0.98 |
| CV (%) | 26.06 ± 2.69 | 25.90 ± 2.82 | 24.70 ± 1.65 | 25.75 ± 3.18 | 0.27 ^{1WA} | 20 | 0.85 |
| K | 0.75 ± 0.01 | 0.75 ± 0.00 | 0.75 ± 0.01 | 0.77 ± 0.02 | 2.63 ^{KW} | 20 | 0.45 |

Values are presented as mean ± SD. Number of considered experimental units (n). One-way ANOVA (^{1WA}) or Kruskal-Wallis (^{KW}) test results are power of test (F), and level of significance (P). Different superscripts (a, b) indicate significant differences (Tukey HSD test, $P < 0.05$) within one row.

Supplement 2. Fish biomass in tank (B), individual body weight (BW), total body length (TL and SL), specific growth rate (SGR), food conversion ratio (FCR), coefficient of variation (CV), condition factor (K), and overall mortality (OM) of *C. gariepinus* juveniles after 14 days of feeding with four experimental HS diets (HS0-HS6).

| Parameters | HS0 | HS1 | HS3 | HS6 | F^{test} | n | P |
|--------------------------|---------------|---------------|---------------|---------------|---------------------|--------|--------|
| Period (d) | Day 14 | Day 14 | Day 14 | Day 14 | Day 14 | Day 14 | Day 14 |
| B (kg) | 4.30 ± 0.19 | 4.16 ± 0.20 | 4.33 ± 0.16 | 4.25 ± 0.21 | 0.84 ^{1WA} | 20 | 0.49 |
| BW (g) | 53.34 ± 4.81 | 51.16 ± 2.30 | 50.45 ± 4.32 | 49.76 ± 3.82 | 0.78 ^{1WA} | 20 | 0.52 |
| TL (mm) | 186.61 ± 5.52 | 184.15 ± 3.88 | 185.77 ± 4.43 | 183.38 ± 5.80 | 0.44 ^{1WA} | 20 | 0.73 |
| SL (mm) | 168.02 ± 5.53 | 165.29 ± 3.92 | 167.44 ± 4.05 | 165.28 ± 5.38 | 0.45 ^{1WA} | 20 | 0.72 |
| SGR (% d ⁻¹) | 3.61 ± 0.52 | 3.49 ± 0.52 | 3.05 ± 0.65 | 2.90 ± 0.58 | 1.79 ^{1WA} | 20 | 0.19 |
| FCR | 0.98 ± 0.13 | 1.13 ± 0.09 | 1.06 ± 0.06 | 1.19 ± 0.27 | 5.13 ^{KW} | 20 | 0.16 |
| CV (%) | 36.69 ± 3.18 | 35.18 ± 5.39 | 35.19 ± 8.01 | 39.99 ± 8.86 | 0.56 ^{1WA} | 20 | 0.64 |
| K | 0.82 ± 0.01 | 0.82 ± 0.03 | 0.79 ± 0.02 | 0.81 ± 0.02 | 2.82 ^{1WA} | 20 | 0.07 |
| OM (%) | 9.33 ± 1.49 | 8.89 ± 2.48 | 7.56 ± 3.28 | 5.56 ± 3.77 | 1.73 ^{1WA} | 20 | 0.20 |

Values are presented as mean ± SD. Number of considered experimental units (n). One-way ANOVA (^{1WA}) or Kruskal-Wallis (^{KW}) test results are power of test (F), and level of significance (P). Different superscripts (a, b) indicate significant differences (Tukey HSD test, $P < 0.05$) within one row.

Supplement 3. Fish biomass in tank (B), individual body weight (BW), total body length (TL and SL), specific growth rate (SGR), food conversion ratio (FCR), coefficient of variation (CV), condition factor (K), and overall mortality (OM) of *C. gariepinus* juveniles after 28 days of feeding with four experimental HS diets (HS0-HS6).

| Parameters | HS0 | HS1 | HS3 | HS6 | <i>F</i> ^{test} | <i>n</i> | <i>P</i> |
|--------------------------|---------------|---------------|---------------|---------------|--------------------------|----------|----------|
| Period (d) | Day 28 | Day 28 | Day 28 | Day 28 | Day 28 | Day 28 | Day 28 |
| B (kg) | 6.06 ± 0.15 | 5.88 ± 0.35 | 6.23 ± 0.21 | 6.21 ± 0.28 | 1.96 ^{1WA} | 20 | 0.16 |
| BW (g) | 83.86 ± 3.63 | 78.75 ± 8.04 | 77.68 ± 8.52 | 75.65 ± 2.96 | 1.54 ^{1WA} | 20 | 0.24 |
| TL (mm) | 215.58 ± 4.42 | 209.94 ± 8.09 | 211.47 ± 6.98 | 209.76 ± 3.97 | 1.19 ^{1WA} | 20 | 0.35 |
| SL (mm) | 192.77 ± 3.46 | 186.58 ± 7.62 | 185.11 ± 6.37 | 184.23 ± 3.84 | 2.67 ^{1WA} | 20 | 0.08 |
| SGR (% d ⁻¹) | 3.25 ± 0.82 | 3.06 ± 0.75 | 3.07 ± 0.80 | 3.00 ± 0.61 | 0.10 ^{1WA} | 20 | 0.96 |
| FCR | 1.09 ± 0.17 | 1.07 ± 0.09 | 1.01 ± 0.04 | 0.96 ± 0.09 | 1.36 ^{1WA} | 20 | 0.29 |
| CV (%) | 37.30 ± 2.74 | 41.65 ± 5.82 | 45.80 ± 4.52 | 40.80 ± 5.59 | 2.62 ^{1WA} | 20 | 0.09 |
| K | 0.84 ± 0.02 | 0.85 ± 0.02 | 0.82 ± 0.04 | 0.82 ± 0.02 | 1.60 ^{1WA} | 20 | 0.23 |
| OM (%) | 14.67 ± 1.45 | 13.78 ± 2.30 | 12.44 ± 1.83 | 12.67 ± 2.68 | 1.73 ^{1WA} | 20 | 0.20 |

Values are presented as mean ± SD. Number of considered experimental units (*n*). One-way ANOVA (^{1WA}) or Kruskal-Wallis (^{KW}) test results are power of test (*F*), and level of significance (*P*). Different superscripts (a, b) indicate significant differences (Tukey HSD test, *P* < 0.05) within one row.

Supplement 4. Fish biomass in tank (B), individual body weight (BW), total body length (TL and SL), specific growth rate (SGR), food conversion ratio (FCR), coefficient of variation (CV), condition factor (K), and overall mortality (OM) of *C. gariepinus* juveniles after 42 days of feeding with four experimental HS diets (HS0-HS6).

| Parameters | HS0 | HS1 | HS3 | HS6 | <i>F</i> ^{test} | <i>n</i> | <i>P</i> |
|--------------------------|----------------|----------------|---------------|----------------|--------------------------|----------|----------|
| Period (d) | Day 42 | Day 42 | Day 42 | Day 42 | Day 42 | Day 42 | Day 42 |
| B (kg) | 8.28 ± 0.29 | 8.15 ± 0.60 | 8.55 ± 0.28 | 8.29 ± 0.46 | 0.74 ^{1WA} | 20 | 0.54 |
| BW (g) | 122.59 ± 12.24 | 119.19 ± 10.32 | 124.87 ± 8.08 | 117.94 ± 17.16 | 0.33 ^{1WA} | 20 | 0.81 |
| TL (mm) | 242.65 ± 6.24 | 239.48 ± 10.25 | 246.09 ± 6.75 | 240.30 ± 10.51 | 0.58 ^{1WA} | 20 | 0.63 |
| SL (mm) | 219.42 ± 5.55 | 216.17 ± 9.90 | 220.85 ± 6.31 | 216.10 ± 9.29 | 0.45 ^{1WA} | 20 | 0.72 |
| SGR (% d ⁻¹) | 2.69 ± 0.48 | 2.97 ± 0.75 | 3.41 ± 0.64 | 3.12 ± 0.84 | 0.96 ^{1WA} | 20 | 0.43 |
| FCR | 1.07 ± 0.09 | 1.02 ± 0.11 | 1.05 ± 0.04 | 1.15 ± 0.10 | 2.13 ^{1WA} | 20 | 0.14 |
| CV (%) | 44.35 ± 8.02 | 43.00 ± 8.45 | 36.55 ± 3.70 | 39.91 ± 2.95 | 1.53 ^{1WA} | 20 | 0.25 |
| K | 0.86 ± 0.05 | 0.87 ± 0.04 | 0.84 ± 0.02 | 0.85 ± 0.02 | 1.17 ^{1WA} | 20 | 0.35 |
| OM (%) | 24.22 ± 2.41 | 21.20 ± 1.48 | 18.20 ± 1.30 | 20.40 ± 2.79 | 3.02 ^{1WA} | 20 | 0.06 |

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Supplement 5. Biochemical parameters (total proteins, TP; alanine aminotransferase, ALT; aspartate aminotransferase, AST; cholesterol, CHOL; triglycerides, TAG; lactate dehydrogenase, LDH; glucose, GLU) and glutathione (reduced glutathione, GSH; oxidized glutathione, GSSG; glutathione ratio, GSH/GSSG) of *C. gariepinus* after 0 and 28 days of feeding reduced glutathione, with four experimental HS diets (HS0, HS1, HS3, HS6).

| Parameters | Initial | HS0 | HS1 | HS3 | HS6 | <i>F</i> | <i>n</i> | <i>P</i> |
|------------------------------|----------------|-----------------------------|---------------------------|----------------------------|----------------------------|---------------------|----------|----------|
| Period (d) | Day 0 | Day 28 | Day 28 | Day 28 | Day 28 | Day 28 | Day 28 | Day 28 |
| TP (g L ⁻¹) | 27.23 ± 4.95 | 35.81 ± 9.35 | 32.46 ± 2.14 | 33.52 ± 5.77 | 33.36 ± 6.54 | 0.32 ^{KW} | 40 | 0.96 |
| ALT (ukat L ⁻¹) | 3.36 ± 1.41 | 0.99 ± 0.97 | 0.75 ± 0.14 | 0.87 ± 0.33 | 0.73 ± 0.24 | 1.83 ^{KW} | 40 | 0.61 |
| AST (ukat L ⁻¹) | 2.75 ± 0.82 | 1.82 ± 1.88 | 1.35 ± 0.41 | 2.07 ± 1.15 | 1.49 ± 0.59 | 4.51 ^{KW} | 40 | 0.21 |
| CHOL (mmol L ⁻¹) | 3.25 ± 0.65 | 3.33 ± 0.61 | 3.31 ± 0.53 | 3.10 ± 0.36 | 3.12 ± 0.41 | 0.58 ^{KW} | 40 | 0.90 |
| TAG (mmol L ⁻¹) | 1.49 ± 1.30 | 1.03 ± 0.80 | 0.81 ± 0.16 | 1.10 ± 1.01 | 0.70 ± 0.19 | 3.81 ^{KW} | 40 | 0.28 |
| LDH (ukat L ⁻¹) | 6.03 ± 2.52 | 2.96 ± 1.47 | 3.72 ± 1.14 | 4.73 ± 2.09 | 3.58 ± 1.04 | 2.42 ^{KW} | 40 | 0.08 |
| GLU (mmol L ⁻¹) | 4.83 ± 3.85 | 6.21 ± 3.01 ^a | 3.88 ± 0.96 ^b | 3.86 ± 1.33 ^b | 3.9 ± 1.34 ^b | 3.89 ^{IWA} | 40 | 0.02 |
| GSH (μM) | 204.65 ± 41.28 | 153.45 ± 65.75 | 133.97 ± 20.89 | 135.60 ± 29.12 | 133.62 ± 33.5 | 0.30 ^{KW} | 40 | 0.96 |
| GSSG (μM) | 43.89 ± 15.65 | 13.63 ± 5.47 ^a | 17.37 ± 4.01 ^b | 9.08 ± 5.18 ^a | 12.14 ± 6.43 ^a | 4.15 ^{IWA} | 40 | 0.01 |
| GSH/GSSG (μM) | 2.98 ± 1.26 | 13.44 ± 18.66 ^{ab} | 6.03 ± 1.09 ^a | 19.35 ± 16.02 ^b | 11.78 ± 8.49 ^{ab} | 10.78 ^{KW} | 40 | 0.01 |

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