**S1 Table** **Analyzed amino acid compositions (g/kg as-fed basis) of the experimental diets**

|  |  |
| --- | --- |
| Item | Dietary CP level (%) |
| 0 | 3 | 6 | 9 | 12 | 15 | 18 | 21 |
| Indispensable amino acids |  |
| Arginine | 0.10  | 1.93  | 3.74  | 5.55  | 7.28  | 9.16  | 10.97  | 12.77  |
| Histidine | 0.05  | 0.73  | 1.42  | 2.10  | 2.76  | 3.47  | 4.16  | 4.84  |
| Isoleucine | 0.09  | 1.28  | 2.48  | 3.67  | 4.81  | 6.06  | 7.26  | 8.45  |
| Leucine | 0.11  | 2.23  | 4.32  | 6.40  | 8.40  | 10.57  | 12.66  | 14.75  |
| Lysine | 0.10  | 1.69  | 3.28  | 4.86  | 6.37  | 8.02  | 9.60  | 11.18  |
| Methionine | 0.00  | 0.35  | 0.68  | 1.01  | 1.32  | 1.66  | 1.99  | 2.32  |
| Phenylalanine | 0.10  | 1.47  | 2.85  | 4.23  | 5.54  | 6.98  | 8.36  | 9.73  |
| Threonine | 0.07  | 1.09  | 2.10  | 3.11  | 4.09  | 5.14  | 6.16  | 7.16  |
| Valine | 0.04  | 1.37  | 2.64  | 3.91  | 5.13  | 6.46  | 7.74  | 9.01  |
| Dispensable amino acids |  |
| Alanine | 0.09  | 1.26  | 2.44  | 3.61  | 4.73  | 5.96  | 7.13  | 8.31  |
| Aspartic acid1 | 0.21  | 3.21  | 6.20  | 9.19  | 12.07  | 15.19  | 18.19  | 21.18  |
| Cysteine | 0.01  | 0.40  | 0.77  | 1.14  | 1.50  | 1.89  | 2.26  | 2.63  |
| Glutamic acid1 | 0.24  | 5.07  | 9.81  | 14.53  | 19.07  | 24.00  | 28.74  | 33.46  |
| Glycine | 0.08  | 1.25  | 2.41  | 3.57  | 4.69  | 5.90  | 7.06  | 8.23  |
| Proline | 0.03  | 1.40  | 2.71  | 4.01  | 5.26  | 6.62  | 7.93  | 9.23  |
| Serine | 0.05  | 1.43  | 2.77  | 4.10  | 5.38  | 6.77  | 8.10  | 9.44  |
| Total | 1.28  | 26.16  | 50.62  | 75.00  | 98.41  | 123.84  | 148.30  | 172.68  |

CP = crude protein; NFD = nitrogen-free diet.

1 The respective values for aspartic acid and glutamic acid represent the sum of the concentrations for both the amide and acid derivatives. Tryptophan and tyrosine were destroyed in acid hydrolysis, and were not determined in this study.