

**Additional file 1 The components of the feed that used in the study**

| Components       | percent       |
|------------------|---------------|
| crude protein    | $\geq 30.0\%$ |
| crude fiber      | $\leq 15.0\%$ |
| crude ash        | $\leq 12.0\%$ |
| crude fat        | $\geq 2.5\%$  |
| total phosphorus | 0.6~2.2%      |
| Water            | $\leq 13.0\%$ |
| lysine           | $\geq 1.3\%$  |