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**Table S1** Analysis of key flavor compounds of the dry-aged beef

| Flavor compounds | Species | Odor characteristics [29-30] | Sensory threshold (μg/kg) | ROAV | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 0 d | 3.5 d | 7 d | 14 d | 21 d |
| aldehydes | Hexanal | Fragrance of grass, fruit, leaf | 4.5 | — | 0.11 | 0.45 | 0.99 | 0.44 |
| | Heptanal | Fruit, milk, soap | 3 | 0.94 | 3.27 | 5.02 | — | 2.17 |
| | Octanal | Citrus, lemon, honey, Aroma of fruit, wax, fresh grass | 0.8 | 10.10 | 17.97 | 11.70 | 10.86 | 14.33 |
| | Nonanal | Fragrance of flowers, citrus, grass, wax, fat | 1 | 100.00 | 100.00 | 40.99 | 53.38 | 100.00 |
| | Furfural | Aromas of wood, caramel, baked goods | 3 | 0.20 | 0.27 | — | — | — |
| alcohols | Pentanol | Mild fruit and spice aromas | 0.15 | — | 14.41 | 100.00 | 100.00 | 27.33 |
| | 1-Octanol | Strong floral, citrus, walnut, moss notes | 110 | 0.08 | 0.10 | 0.13 | 0.11 | 0.09 |
| | Oct-1-en-3-ol | Mushroom, earth, grass, lavender, rose | 1 | 2.16 | 3.75 | 9.73 | 6.55 | 6.24 |
| alkenes | Styrene | Sweet scent, floral scent, sesame oil scent | 47 | 0.14 | 0.01 | — | 0.54 | 0.05 |
| ketones | Acetoin | Strong notes of milk, butter, mushroom, and vanilla | 55 | 0.85 | 0.30 | 3.25 | 6.45 | 0.67 |
| esters | Vinyl Hexanoate | Ester flavor | 7.5 | 0.29 | 0.33 | 1.80 | — | — |
| furans | 2-Amylfuran | Fresh, meaty, mung bean, butter | 6 | 0.31 | 0.70 | 1.09 | 0.80 | 0.24 |

**Table S2** Effective sequence statistics of bacteria and fungi

| Sample | Bacteria | | Fungi | |
|---|---|---|---|---|
| | The number of effective sequences | The length of effective sequences (M) | The number of effective sequences | The length of effective sequences (M) |
| 0 d | 65490 | 27.28 | 80432 | 22.02 |
| 3.5 d | 67267 | 28.38 | 80452 | 21.77 |
| 7 d | 62268 | 26.53 | 79890 | 21.77 |
| 14 d | 56089 | 23.94 | 75915 | 21.08 |
| 21 d | 67244 | 28.70 | 80477 | 21.72 |

**Table S3** Diversity analysis of bacterial community during the dry aging process

| Sample | Shannon | Simpson | Chao1 | Goods _coverage |
|---|---|---|---|---|
| 0 d | 6.42 | 0.97 | 279.00 | 1.00 |
| 3.5 d | 4.58 | 0.87 | 162.05 | 1.00 |
| 7 d | 2.78 | 0.65 | 39.83 | 1.00 |
| 14 d | 3.64 | 0.87 | 34.33 | 1.00 |
| 21 d | 2.64 | 0.65 | 37.33 | 1.00 |

**Table S4** Diversity analysis of fungi during the dry aging process

| Sample | Shannon | Simpson | Chao1 | Goods_coverage |
|---|---|---|---|---|
| 0 d | 3.52 | 0.79 | 77.00 | 1.00 |
| 3.5 d | 2.76 | 0.69 | 56.00 | 1.00 |
| 7 d | 1.87 | 0.49 | 50.67 | 1.00 |
| 14 d | 2.72 | 0.71 | 41.67 | 1.00 |
| 21 d | 1.59 | 0.44 | 39.00 | 1.00 |