# Appendix 1 (online supplementary information): FRUITS model

Diet reconstruction based on human collagen stable isotope data (Table 1), performed using FRUITS (Food Reconstruction Using Isotopic Transferred Signals) Beta version 2.1 (Fernandes *et al.* 2014).

## FRUITS model parameterisation (applied to all individuals)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Food group | Protein content | Energy content | Protein δ15N | Protein δ13C | Energy δ13C |
| Plant | 10±2% | 90±2% | 2.0±0.5‰ | -26.0±0.5‰ | -26.0±0.5‰ |
| Animal | 60±3% | 40±3% | 7.0±0.5‰ | -23.4±0.5‰ | -29.4±0.5‰ |
| Fish | 80±2% | 20±2% | 11.4±0.5‰ | -26.5±0.5‰ | -32.5±0.5‰ |

Diet-collagen isotopic offsets: δ13C + 5.0±0.5‰, δ15N 5.0±1.0‰

Dietary routing: δ15N derived 100% from protein; δ13C derived 75±5% from protein, 25±5% from energy macronutrients

Protein consumption restricted to 10–40% of overall food intake

## Individual estimates (model output)

**B129: δ13C -23.0±0.5‰, δ15N 13.4±0.5‰**

Overall intake

animal mean 8.9±7.8%, median 6.7%

plant mean 65.7±8.5%, median 64.7%

fish mean 25.5±8%, median 25.8%

energy mean 67.9±5.5%, median 66.9%

protein mean 32.1±5.5%, median 33.1%

Contribution to δ15N

animal mean 16.1±13.4%, median 12.8%

plant mean 22.2±7.5%, median 20.9%

fish mean 61.7±13.6%, median 63.6%

Contribution to δ13C

animal mean 11.6±9.9%, median 9%

plant mean 48.7±10.1%, median 47.2%

fish mean 39.7±11.3%, median 40.3%

**M02: δ13C -21.8±0.5‰, δ15N 13.3±0.5‰**

Overall intake

animal mean 13.2±10.3%, median 11%

plant mean 64.9±9.3%, median 64.3%

fish mean 22±8%, median 21.9%

energy mean 68.1±5.5%, median 67.4%

protein mean 31.9±5.5%, median 32.6%

Contribution to δ15N

animal mean 23.7±17.1%, median 20.7%

plant mean 22.4±7.9%, median 20.9%

fish mean 53.9±15.8%, median 55.6%

Contribution to δ13C

animal mean 17.3±13%, median 14.7%

plant mean 48.1±10.7%, median 46.8%

fish mean 34.6±11.8%, median 34.7%

**M01: δ13C -23.3±0.5‰, δ15N 11.2±0.5‰**

Overall intake

animal mean 9.9±9.1%, median 7.3%

plant mean 75.4±10.7%, median 77.2%

fish mean 14.7±7.7%, median 13.5%

energy mean 74.7±6.6%, median 75.4%

protein mean 25.3±6.6%, median 24.6%

Contribution to δ15N

animal mean 21.7±17.1%, median 17.9%

plant mean 34.5±12.7%, median 33.5%

fish mean 43.8±16.3%, median 44.7%

Contribution to δ13C

animal mean 13.8±11.8%, median 10.7%

plant mean 61.8±13.2%, median 62.5%

fish mean 24.5±11.6%, median 23.5%

**M03: δ13C -20.9±0.5‰, δ15N 8.5±0.5‰**

Overall intake

animal mean 12.4±11%, median 9.3%

plant mean 84.4±11.1%, median 87.5%

fish mean 3.2±2.7%, median 2.5%

energy mean 81.2±5.8%, median 82.6%

protein mean 18.8±5.8%, median 17.4%

Contribution to δ15N

animal mean 33.6±20.8%, median 31.7%

plant mean 53.3±18.2%, median 54.5%

fish mean 13.2±10%, median 11.2%

Contribution to δ13C

animal mean 18.8±14.7%, median 15.2%

plant mean 75.2±14.6%, median 78.5%

fish mean 6±4.9%, median 4.8%

**M16: δ13C -20.5±0.5‰, δ15N 8.0±0.5‰**

Overall intake

animal mean 11.8±10.9%, median 8.4%

plant mean 85.7±11%, median 89%

fish mean 2.6±2.3%, median 2%

energy mean 81.8±5.7%, median 83.2%

protein mean 18.2±5.7%, median 16.8%

Contribution to δ15N

animal mean 32.4±20.6%, median 30.4%

plant mean 56.7±18.5%, median 58.5%

fish mean 10.9±8.7%, median 8.9%

Contribution to δ13C

animal mean 17.9±14.6%, median 14.1%

plant mean 77.3±14.5%, median 80.9%

fish mean 4.9±4.1%, median 3.8%

**M06: δ13C -21.5±0.5‰, δ15N 9.3±0.5‰**

Overall intake

animal mean 13.7±11.4%, median 10.5%

plant mean 81.2±11.6%, median 84.3%

fish mean 5.1±3.9%, median 4.3%

energy mean 79.3±6.1%, median 80.6%

protein mean 20.7±6.1%, median 19.4%

Contribution to δ15N

animal mean 34.3±20.7%, median 32.8%

plant mean 46.8±16.6%, median 47.4%

fish mean 18.9±12.7%, median 17.4%

Contribution to δ13C

animal mean 20±14.9%, median 16.8%

plant mean 70.8±14.7%, median 73.6%

fish mean 9.2±6.8%, median 7.9%

**M10: δ13C -21.6±0.5‰, δ15N 10.4±0.5‰**

Overall intake

animal mean 17.8±12.9%, median 15%

plant mean 74±12.9%, median 75.8%

fish mean 8.2±5.9%, median 7%

energy mean 75.1±6.9%, median 75.8%

protein mean 24.9±6.9%, median 24.2%

Contribution to δ15N

animal mean 38.6±21.4%, median 37.6%

plant mean 36±15%, median 34.5%

fish mean 25.5±15.4%, median 24.1%

Contribution to δ13C

animal mean 24.8±16.3%, median 22.1%

plant mean 61.3±15.4%, median 62.1%

fish mean 13.9±9.4%, median 12.3%

**M08: δ13C -23.7±0.5‰, δ15N 13.8±0.5‰**

Overall intake

animal mean 6.5±6%, median 4.7%

plant mean 65.2±8.1%, median 64%

fish mean 28.3±7.6%, median 29%

energy mean 67.2±5.4%, median 66.3%

protein mean 32.8±5.4%, median 33.7%

Contribution to δ15N

animal mean 11.6±10.4%, median 8.7%

plant mean 20.8±7.1%, median 19.4%

fish mean 67.6±11.4%, median 69.4%

Contribution to δ13C

animal mean 8.5±7.7%, median 6.3%

plant mean 47.6±9.6%, median 46%

fish mean 43.9±10.4%, median 44.9%

**M15: δ13C -20.5±0.5‰, δ15N 8.8±0.5‰**

Overall intake

animal mean 16.6±12.9%, median 13.4%

plant mean 79.9±12.9%, median 83%

fish mean 3.5±2.9%, median 2.8%

energy mean 79±6.6%, median 80.3%

protein mean 21.1±6.6%, median 19.8%

Contribution to δ15N

animal mean 40.5±22.1%, median 40.4%

plant mean 46.4±18.5%, median 46.3%

fish mean 13.1±10.2%, median 11%

Contribution to δ13C

animal mean 24.3±16.8%, median 21.4%

plant mean 69.4±16.3%, median 72.1%

fish mean 6.4±5.2%, median 5.2%