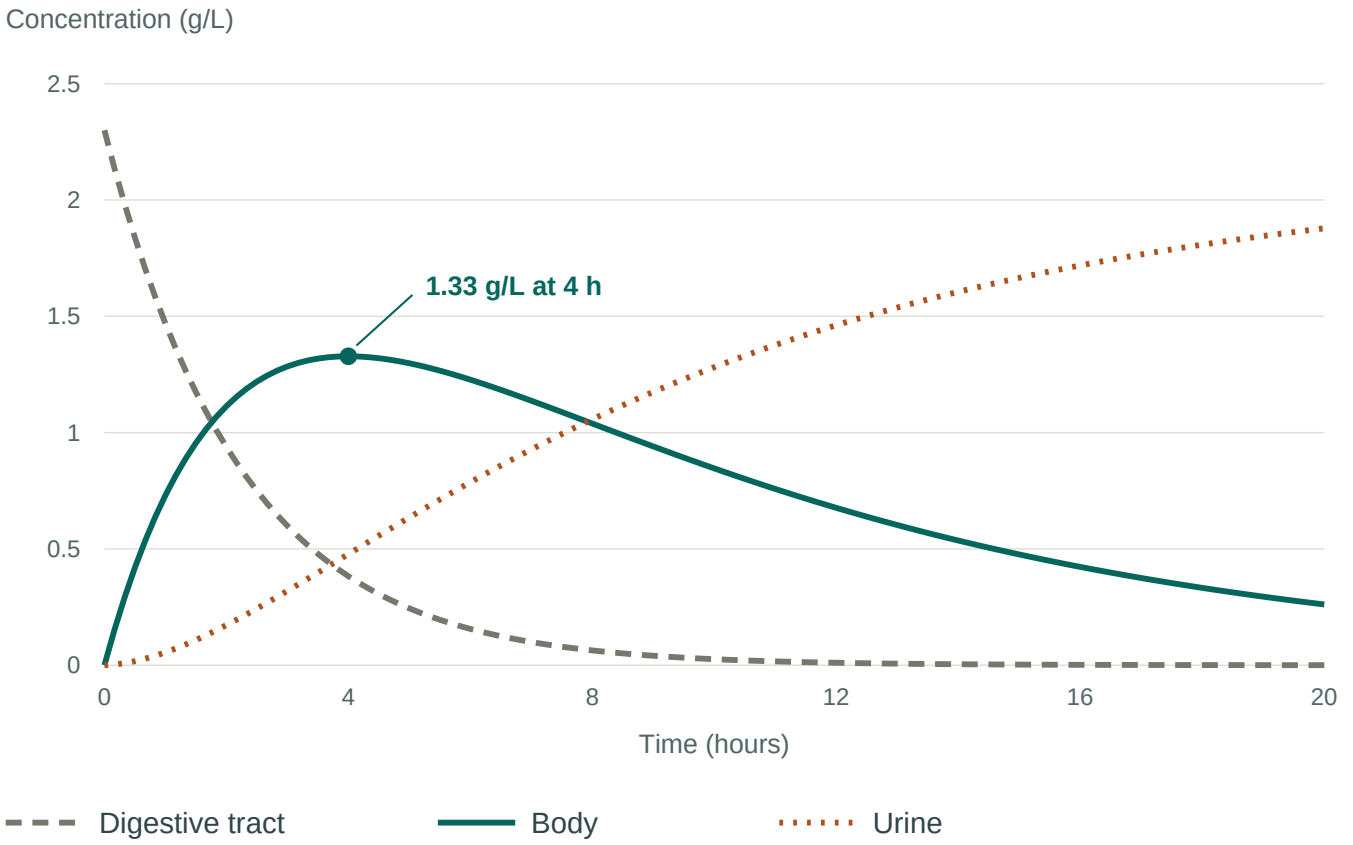
Modeling absorption and elimination

When does the concentration in the body reach its maximum if absorption and elimination take place at different rates?

Three compartments, 20 simulated hours



How the workbook models transfer

The simulation starts at 2.30 g/L in the digestive tract and zero in the other two compartments. We used membrane area, thickness, diffusivity and compartment volume to calculate the first-order transfer rates.

The absorption rate was 0.0072 per minute and the elimination rate was 0.0020 per minute. The spreadsheet updates the digestive tract, body and urine in sequence every 10 minutes, yielding 121 values for each compartment.

Reading the peak

At first, absorption into the body outpaces elimination. As the digestive tract empties, the balance reverses. The highest stored body concentration occurs at four hours, then falls to 0.26 g/L by hour 20.

Portfolio note based on our original spreadsheet submission of 27 March 2024.

The curves reproduce the workbook’s calculated values at each time step.