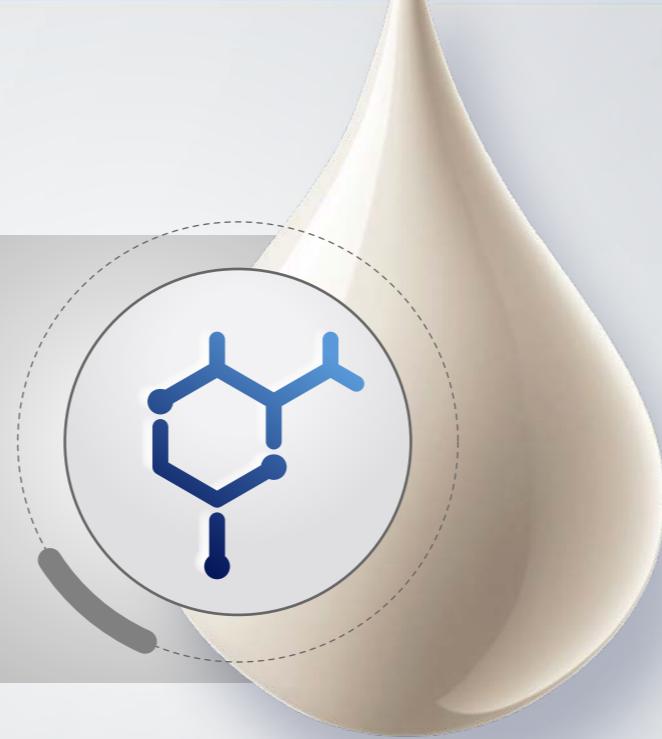


AMINO ACIDS



Human milk contains proteins, these are compounds consisting of amino acids (AAs), which are connected by peptide bonds.²⁶

In addition to other functions, proteins serve as an energy source: human milk proteins provide around 7% of total energy in mature milk.²⁷⁻³⁰

Human milk also contains free amino acids (FAAs), which account for 4–10% of the total AA content in human milk.^{31,32}

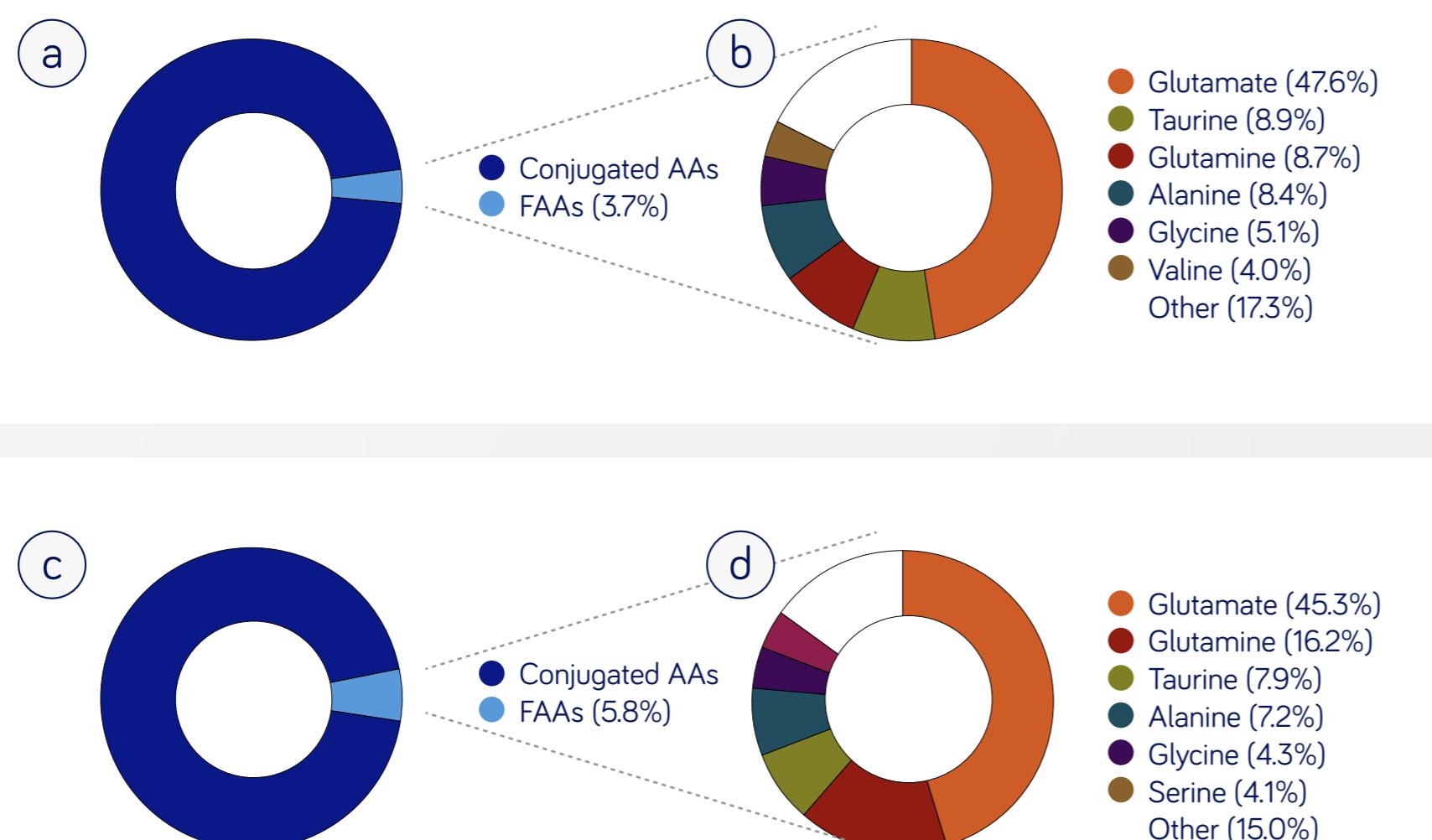
✓ Infant and maternal characteristics influence the levels of FAAs and total amino acids (TAAs, i.e., the sum of conjugated AAs and FAAs) in human milk.^{31,32,33}

✓ TAAs can be used to estimate the combined protein and peptide levels.³⁴

✓ FAAs can confer immunological benefits such as protection against neonatal allergies or infections.³⁴

FREE AND CONJUGATED AA RATIOS AT 6 WEEKS & 6 MONTH POST PARTUM

At 6 weeks 3.7% (a) and at 6 months 5.8% (c) of AAs found in human milk are represented by FAAs. The majority of AAs found in human milk are bound in human milk proteins (>96% TAAs at 6 weeks (a) and >94% TAAs (c) at 6 months). The relative abundance of individual FAAs at 6 weeks and 6 months are visualized in figures b and d, respectively. The two most abundant FAAs in human milk are glutamate and glutamine.



NEW INSIGHTS INTO FA (FREE & CONJUGATED)

The present study showed that the FAAs glutamine and glutamate are highly abundant in human milk, both at 6 weeks (56.3%) and at 6 months (61.5%).

The sum of FAAs was higher at 6 months compared to 6 weeks of lactation. Temporal changes of FAAs in human milk between 6 weeks and 6 months of lactation were AA-specific.

Our results suggest gender related differences in temporal changes of the sum of FAA concentrations (not significant but by trend). Levels of most FAAs were slightly higher in human milk for boys in early lactation, but not at later stages of lactation.

Free glutamine, glutamate, and serine in 6-week human milk positively correlated with infant weight gain in the first 4–5 weeks of life.

These results suggest that specific FAAs may play a role in infant growth.