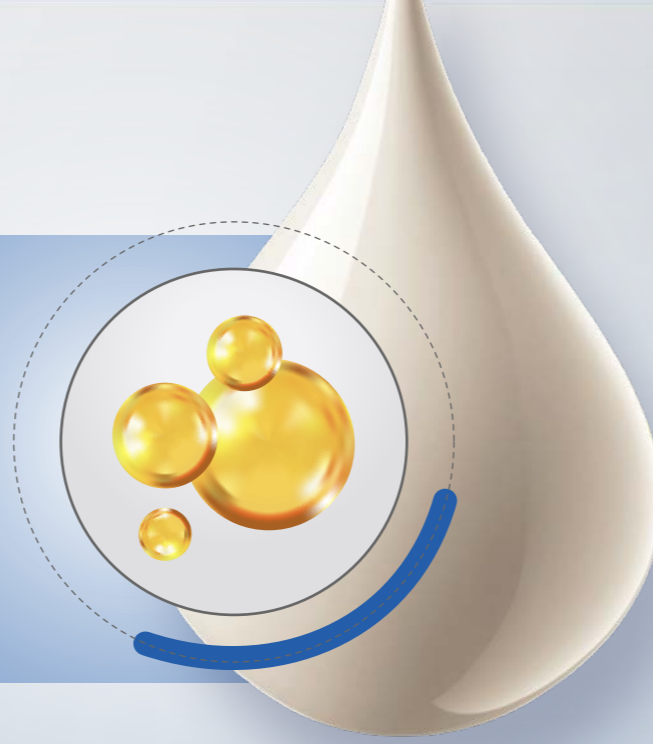


# FATTY ACIDS



- ✓ The FA composition in human milk can affect infant growth and (long term) immune, brain and metabolic health.<sup>21-23</sup>
- ✓ The FA profile is influenced by maternal fat stores and diet.<sup>21,25</sup>

Lipids are the second largest group of macronutrients in human milk.<sup>21</sup> Amongst other functions lipids serve as an energy source: human milk lipids provide ~50% of total energy needed for growth.<sup>21-23</sup>

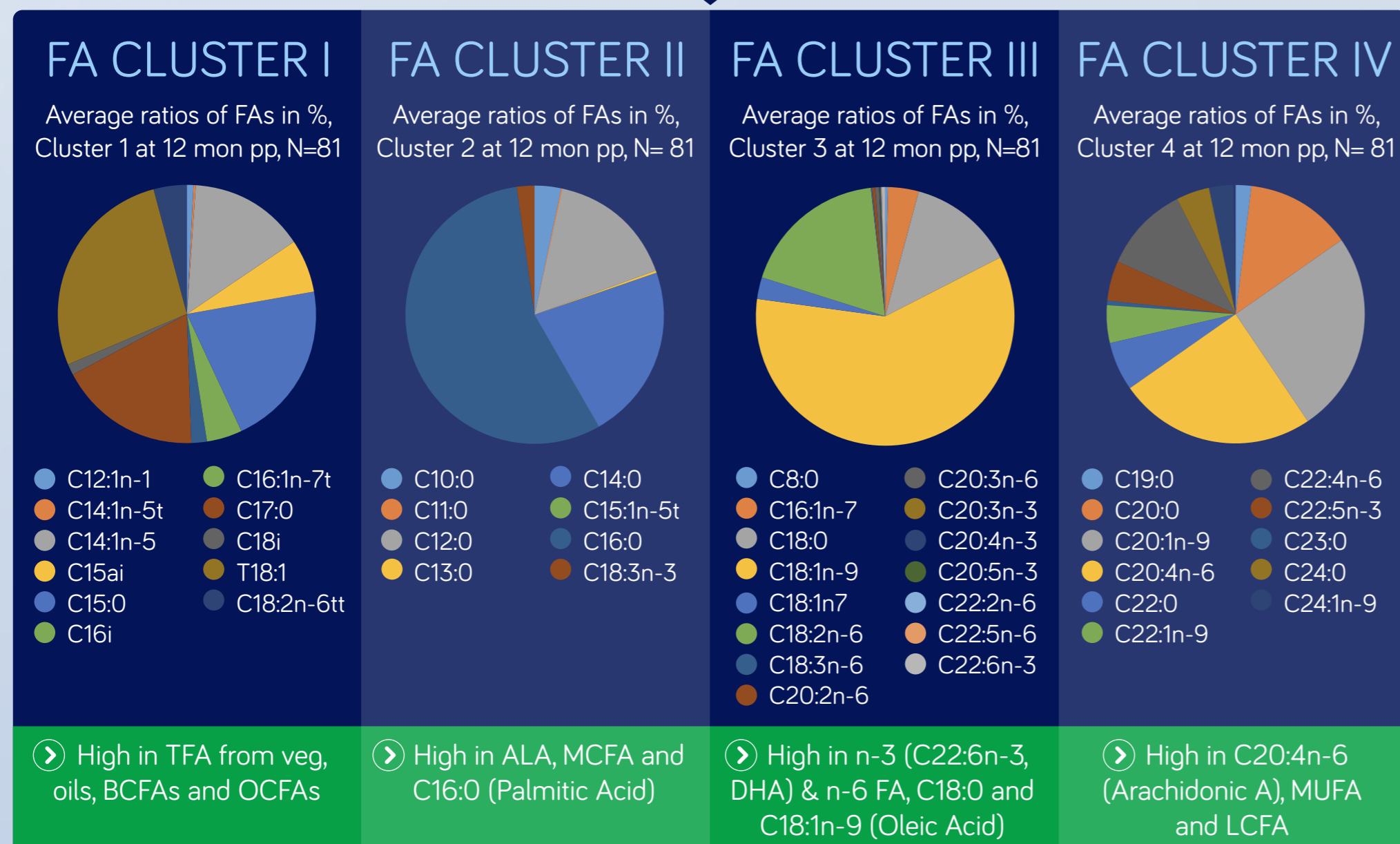
Human milk lipids are incorporated into large globules (milk fat globules) surrounded by a complex triple-layer membrane (milk fat globule membrane).<sup>24</sup>

Fatty Acids (FAs) are essential structural elements of human milk lipids (>97% of lipids are FAs). The most abundant FAs in human milk are saturated fatty acids (SFAs), followed by monounsaturated fatty acids (MUFAs) and polyunsaturated fatty acids (PUFAs).

## FA-PROFILES AT 12 MONTH POST PARTUM

Four different FA-clusters emerged after principal component analysis (PCA) of FA profiles as detected in 81 human milk samples collected at 12 months post-partum. The FA-compounds in the different clusters are highly correlated. However, they vary in chemical properties e.g., degree of saturation, branching, or chain length.

### TOTAL OF HUMAN MILK SAMPLES



## NEW INSIGHTS INTO FAS



The total lipid content increased over lactation and was significantly higher at 6 months ( $\beta = 0.199$ ,  $p = 0.029$ ) and 12 months of lactation ( $\beta = 0.421$ ,  $p < 0.001$ ) compared to 6 weeks.

Levels of individual FAs are different and vary at 6 weeks, 6 months and 12 months. 4 specific FA-clusters consisting of highly correlated individual FAs could be distinguished by PCA of 45 individual fatty acids from 81 human milk samples. These FA patterns may include compounds with different FA chemical structures (see figure).

MCFAs (medium chain fatty acids) (C12:0 and C14:0) were significantly higher at 6 months & 12 months, vs 6 weeks.

General reduction in n-6 FAs (C20:2n-6, C20:3n-6, C22:2n-6, C18:3n-6) & few n-3 FAs (C20:3n-3 and C20:4n-3) over lactation.

Human milk FA composition (levels) during prolonged lactation is different from that of human milk during a short duration of lactation.

Women's lifestyle changes during prolonged lactation may have contributed to changing human milk FA profiles at 12 months.