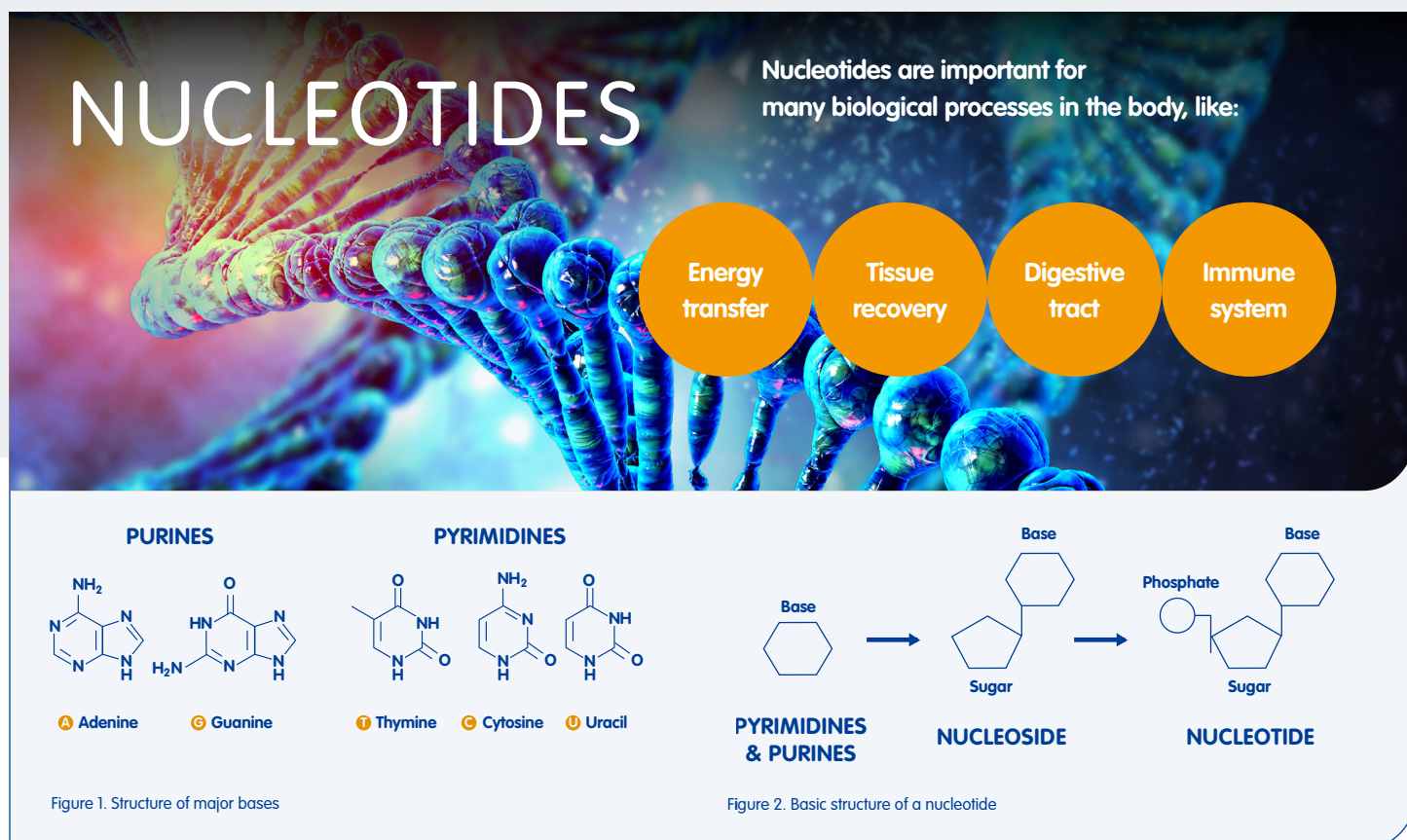


Nucleotides are the building blocks of our DNA (and RNA). A nucleotide is made up of three parts: a phosphate group, a 5-carbon sugar, and a nitrogenous base. The options for the base are one of the following four molecules: adenine (A), thymine (T), guanine (G), and cytosine (C). In RNA thymine (T) is replaced by uracil (U). Five types of nucleotides can be formed (CMP, UMP, GMP, AMP and IMP).



Reference: (5)

WHY do we sometimes add them as an extra to infant formula

The addition of nucleotides is not mandatory but can be added on voluntary basis to infant formula. According to EFSA there is no need to add nucleotides to IF or FOF, due to a the lack of convincing evidence for a benefit (3).

However, some studies suggest several potential benefits of nucleotides like:

- Support immune system (2)
- Modulate the gut microbiota (5)
- Improve the immature digestive system (5)
- Influence sleep regulation (6)

WHY WHEN HOW

Nucleotides have been predominantly associated with immune function, gut health, growth and fatty acid metabolism (5).

Furthermore, nucleotides are conditionally essential nutrients in the presence of rapid growth. Their presence in rapidly growing tissues is both a functional and structural requirement for proper cell function (4).

Studies suggest several potential benefits of nucleotides

WHEN are nucleotides especially important

Nucleotides are considered conditional essential nutrients. In situation of:

- 1) Low dietary intake
- 2) Rapid physical growth
- 3) In presence of disease

The early phase of life is a period of rapid growth and development. Under normal circumstances nucleotides can be produced by the human body (de novo), however this is metabolically costly and could be a limiting factor to infants in phases of rapid growth and enhanced cellular development.

HOW do they naturally occur

Human milk contains nucleotides. Levels around 10.5-11mg/100kcal are reported (3).

Average level of individual nucleotides have been reported to be: 0.7-4.5mg/100kcal for CMP, 0.3-2.3mg/100kcal for UMP, 0.05-1.9mg/100kcal of GMP, 0.2-1.7mg/100kcal for AMP and 0-1.4mg/100kcal for IMP

The highest levels are found in colostrum, which will decrease during lactation. In three months of lactation, the free nucleotide content has been reduced to 75% of that in human colostrum (9).

The addition of nucleotides in infant formula may have been brought your attention. When adding nucleotides to infant formula a maximum level of 5 mg per 100kcal is applicable in most of the countries due to legislation requirements.

In conclusion

Nucleotides can be synthesised by the human body and are required for several important processes. Especially in the early phase of life (0-12 months) they are relevant for growth and development. Therefore nucleotides can be added on voluntary basis to infant formula.

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