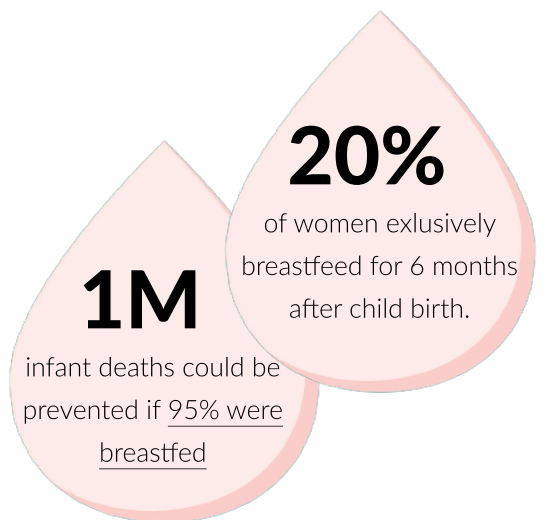


# Antibody-containing Infant Formula

## Synthesizing proteins in breastmilk

Infants that are not fed with breastmilk do not receive nutritional components such as antibodies, proteins, fats and oils, bacteria and hormones. More specifically, Secretory Immunoglobulin A (SIgA), the most prominent antibody in breastmilk functions to protect the gut of the infant from bacteria. This method can then be used to grow other proteins such as in breastmilk in efforts to manufacture a formula that more closely mimics breast milk's health-boosting properties.



1

In trials, Chinese Hamster Ovary cells are grown and lysed (ripped a part). Then, the cellular components required for protein synthesis are extracted.

2

Genes coding for 4 different parts of the SIgA antibody are cloned into an Agrobacterium Tumefaciens plasmid. This creates a template for the transcription portion of protein-synthesis.

3

The cell extract, (ribosomes, aminoacyl-tRNA synthetases, nucleases, translation initiation and elongation factors) + amino acids + water + energy + a plasmid DNA template are combined.

4

2 hours later, the proteins are finished synthesizing and are purified using a Protein A Column. The antibodies are then inserted into infant formula and stored in a frozen form.

## Impact...

A lower number of breastfed has a correlation with higher number of deaths as a cause of Pneumonia and Diarrhea. A more immunogenic formula has the potential to increase the immune response of children in both the developing and developed world to increase health span.



## Challenges



Developing a formula that can be frozen without loss of flavour or consistency

Developing an alternative, more cost-effective method to protein extraction and purification

