

ENSURING THE QUALITY AND SAFETY OF POWDERED INFANT FORMULA FROM FACTORY TO FEEDING

Quality and safety are unequivocal priorities for infant formula manufacturers. Infant formula is the only suitable and evidence-based alternative when infants cannot be breastfed, and therefore must meet the highest safety expectations of regulators, health authorities and caregivers. Manufacturers operate under strict Codex-based food safety systems and national regulations to ensure products are safe, nutritionally appropriate and fit for the most vulnerable population: infants.

■ ■ Safety depends on stringent hygienic manufacturing, followed by safe handling and preparation by caregivers.

Key messages

1

Manufacturers consistently meet – or exceed – Codex Alimentarius hygiene, composition and microbiological criteria

Codex CAC/RCP 66 2008 provides a specific international code of hygienic practice for powdered formulae for infants and young children, addressing contamination risks from microorganisms such as *Cronobacter* spp. and *Salmonella*. Manufacturers actively implement and help advance these standards.

2

Microbiological safety relies on both manufacturing controls and correct preparation

Fresh preparation and adherence to manufacturers' instructions are identified by FAO and WHO as the most effective measures to minimise risks in practice.

3

Reconstitution at 70°C is not the only safe approach

While WHO recommends 70°C as one risk reduction option, Codex recognises alternatives where microbiological quality is high or when infant formulas contain heat sensitive ingredients like probiotics. Reconstitution practices must balance microbiological control with risks such as scalding and nutrient degradation.

Manufacturing: A Multi-Layered Safety System

Strict Raw material Controls

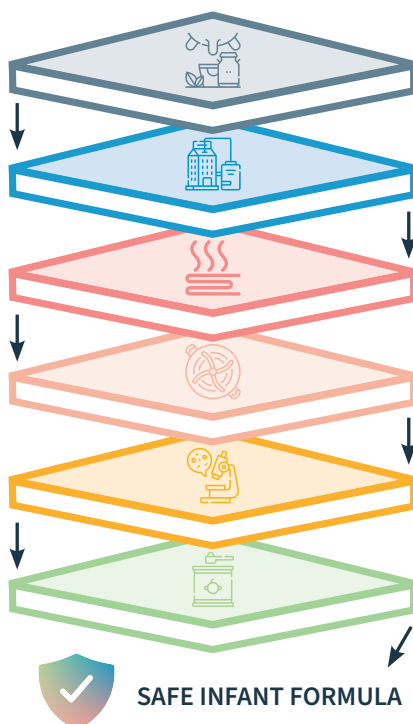
Manufacturers begin with rigorous supplier approval systems, including audits, qualification and validated testing for microbiological, nutritional, sensory and chemical criteria. Only materials meeting stringent specifications enter production.

Heat Treatment

Heat treatments (pasteurisation, UHT, or retort) destroy pathogenic microorganisms such as *Cronobacter* spp. and *Salmonella*. This remains one of the most important safety steps in formula production.

Extensive Monitoring and Verification

Manufacturers use HACCP-based systems, environmental monitoring, product testing, air quality checks and continuous process verification to ensure regulatory and Codex compliance.



Controlled Processing Environments

Production facilities are designed according to Codex General Principles of Food Hygiene, using zoning (low/medium/high care), positive air pressure, controlled ventilation and dust management to prevent contamination. High care areas maintain strict personnel, clothing and equipment controls.

Drying, Blending and Powder Handling

Spray drying rapidly removes water, supporting microbiological stability, while dry blending follows stringent hygiene and testing criteria for ingredients that do not undergo later heat treatment. Final sieving prevents foreign particle contamination.

Packaging to Protect Safety and Nutrition

Packaging provides critical barriers against oxygen, light, moisture and contamination. Many manufacturers flush containers with inert gases to protect nutrients and reduce oxidation.

Safe Preparation, Handling and Storage: The Role of Parents and Caregivers

Even when manufactured under strict hygienic conditions, powdered infant formula may be contaminated after opening or during use. Parents and caregivers therefore play a crucial role in safety.

CORE SAFETY PRACTICES



1

WASH AND STERILISE

Always wash hands with soap and water before preparing infant formula and ensure all containers, utensils and equipment are clean and sterilised.



2

USE SAFE BOILED WATER

Use safe, previously boiled water, allowed to cool for a minimum of five minutes to a temperature depending on manufacturer instructions.



3

PREPARE FRESH FEEDS

Prepare feeds fresh whenever possible; feed immediately or within 2 hours at room temperature.



4

COOL RAPIDLY IF PREPARED HOT

Rapidly cool infant formula to feeding temperature if prepared hot.



5

DISCARD LEFTOVERS

Discard any leftover infant formula after feeding.



6

FOLLOW THE INSTRUCTIONS PRECISELY

Follow manufacturer label instructions precisely – powder to water ratio, hygiene, storage. Manufacturers validate these instructions for safety.



WHY THIS MATTERS

Improper handling is associated with serious microbiological infections, especially in newborns, premature infants and immunocompromised infants.

Industry commitment to food safety

Infant formula manufacturers invest in advanced quality systems, scientific research and stringent hygiene controls to ensure products meet the highest safety standards.

They work closely with regulators, Codex committees, FAO and WHO experts, and scientific bodies to continuously improve manufacturing safety and guidance for parents and caregivers.