

APRIL 2016

## BIOCEUTICALS' THREE-TIERED APPROACH TO PROBIOTIC STABILITY

### 1. Manufacturer selection

BioCeuticals places a great deal of importance on its choice of manufacturers for our probiotic products. Given there is a large variance in viability and resilience of probiotic strains, we only select specialised probiotic suppliers that can demonstrate manufacturing and handling processes that optimise the resilience and viability of each strain and finished products.

### 2. Quality strain selection

The strains included in BioCeuticals probiotic products go through rigorous testing before selection. Parameters that are tested include:

- stability at high temperatures
- survival rate in low pH levels (as seen in the stomach and intestinal tract)
- adherence to intestinal wall and capacity for colonisation and population of the intestinal tract
- ability to stimulate short-chain fatty-acid production.

### 3. Optimised processing and packaging techniques

Depending on the product, and the individual probiotic strain properties, several processing and packaging techniques are applied to the BioCeuticals Probiotic Range including:

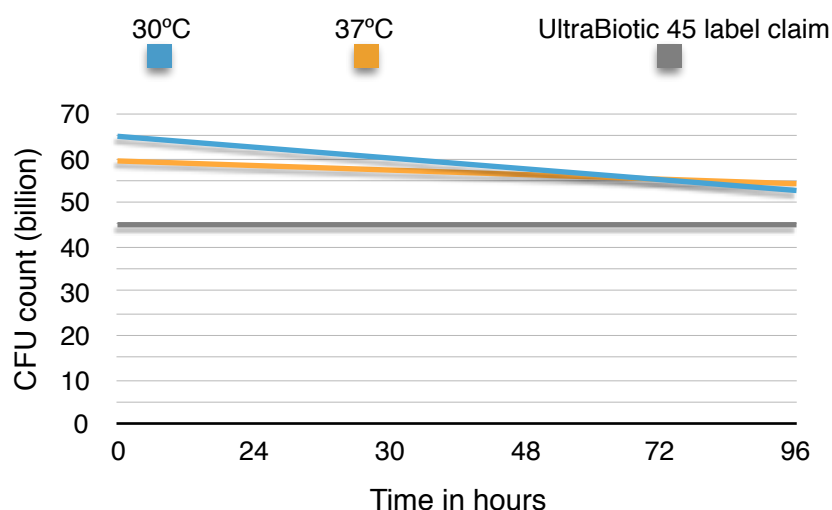
- manufactured in humidity and temperature controlled environments to control moisture content of the raw material and improve stability
- subject to micro-encapsulation and/or freeze-drying, with further dehydration steps applied prior to packaging, again to reduce moisture content and promote stability
- finished in a variety of optimised packaging and dosage formats, including capsules, low permeability sachets and induction-sealed bottles
- an overage is included in all products to ensure that label claims are met during the shelf-life of the product.

### Demonstrated stability results

The graph below shows the resilience and viability of the UltraBiotic 45 strains following short-term exposure to high temperatures.

- After 96 hours at 37°C, 56.5 billion CFU were enumerated per capsule.
- After 96 hours at 30°C, 57 billion CFU were enumerated per capsule.

Both end values are higher than the label claim of 45 billion CFU per capsule, demonstrating that short-term exposure to high temperatures does not compromise the therapeutic value of the product.



Yours in health,

**Muy Leng**

Senior Quality & Regulatory Affairs Manager