FOOD TECHNICAL SERVICES – PROJECT:
MOULD SPOILAGE OF SOUP – WHAT WENT WRONG

Background:

A supplier of chilled ready meals had previously used our services to develop manufacturing processes for chilled vegetable based soup range for catering and retail trades (able to meet a 3 week shelf life).

The facility didn't have the ideal segregated and facilities for high care "long life" products, so we agreed on a process that involved pasteurising soup within the pack and using their existing rapid cooling system. The basic process became: 1)make soup, 2)heat to 100ºC, 3)hot fill with immediate lidding-sealing, 4) hold at >/=90ºC for 10 Minutes, 5)Rapid cool to their existing stds (to <5ºC within 2hr of heat off), followed by labelling and chilled holding/distribution.
Thus:

- Sealing hot packs reduces "air-in-pack" thus the surviving spores can't then form mould growth
- 90ºC-10min heat eliminates pathogenic bacteria including cold tolerant Clostridium botulinum
- Rapid cooling prevents growth of heat resistant surviving pathogens (eg Bacillus cereus)

Shelf life trials demonstrated that a >/=3 week shelf life was achievable.



The issue

A year or so after the initial project a phone call from our client revealed that:

- One of their customers had complained about "masses" of mould growing on the top the soup.
- Our client was wanting to know what could be done or added to prevent this mould.

During the call - our questioning revealed that:

- The production process had been modified to accommodate larger packs of product.
- With the larger packs, the cooling stage had become too long at nearly 4 hours.
- The lidding stage was now done after cooling – so as to speed up the cooling stage.



What went wrong?

The following explanation was given at the end of the call:

- In vegetables and vegetable soups, we must expect to get mould spores that will survive the heating stages, but the process of "hot fill & seal" reduces air levels and so stops mould growth.
- By changing the process by cooling (now) unsealed packs, they'd created conditions ideal for:
  - Mould spores to activate to form as heavy growth on the now aerobic top surface.
  - Access by eg airborne moulds & other spoilage & or pathogenic microbes.
- Reverting back to the original safer process design: "*hot fill - lid+seal – cool*" should work.
- That a 4hr cooling stage is generally accepted as good practice, so changing from 2 to 4hr is OK
- That if desired, cooling could be speed up by using cold water spray just prior to rapid air cool.

Follow up:

A phone call revealed that the simple solution described in the above brief call – had worked**.**