FOOD TECHNICAL SERVICES – PROJECT:
MOULDY SOUP – WHAT WENT WRONG

Background:

A supplier of chilled ready meals had used our services to assist in the development of a new chilled vegetable based soup range for catering and retail trades – they required at least 3 weeks chilled life.

The facility didn't have a "high risk area" capable of handling open ready to eat long life products, so we agreed that the process would involve pasteurising soup within the pack and using their existing rapid cooling system. The basic process became: 1)make soup, 2)heat upto 100-95ºC 3)hot fill with immediate lidding and seal – 4) hold till core temp has >/=90ºC for 10 Minutes 5)Rapid Cool to their existing stds (to <5ºC within 2hrs of heat off), followed by labelling and chilled holding/distribution. Thus:

- Lidding-sealing at 85-95ºC ensures a low air pack (thus surviving moulds spores can't grow)
- 90ºC for 10 minute eliminates pathogenic bacteria including cold tolerant Clostridium botulinum
- Rapid cooling prevents growth of heat resistant pathogens (eg Bacilli & Clostridium perfringens)

Shelf life trials demonstrated that a 3 week shelf life was very achievable.



The issue

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

- The clients customer had complained about lots of mould growing on the top the soup.
- The client was wanting to know what could be done or added to prevent this mould.

A series of questions revealed that:

- The production process had since been changed to allow for larger packs (buckets) 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:

- That in vegetables thus in vegetable soups, we expect mould spores; these survive the cooking stage, but the process of "hot fill & seal" reduces the air in the pack which controls their growth.
- By changing the process and starting to cool unsealed packs, we see the impact:
  - Moulds and possibly or other microbes (spoilage/pathogenic) can get into the product.
  - Air will reach the top surface and remain there - thus encouraging mould growth.
- Reverting back to the original process design: "*hot fill - lid+seal – cool*" will resolve the issue
- 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 up quickened by using cold water spray just prior to rapid cool.

Follow up:

A follow up call revealed that the solution worked.