FOOD TECHNICAL SERVICES

PROJECT: MOULD SPOILAGE OF SOUP - WANT 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 the incorporated pasteurising soup within the pack and using an existing rapid cooling system. The basic process became: 1)make soup, 2)heat to 100^{o}C, 3)hot fill with immediate lidding-sealing, 4) hold at >/=90^{o}C for 10 Minutes, 5)Rapid cool to their existing stds (to <5^{o}C within 2hr of heat off), followed by labelling and chilled holding/distribution.

Thus:

- Sealing hot packs reduces "air-in-pack" thus any surviving mould spores can't develop as mould growth
- 90^{o}C-10min heat eliminates pathogenic bacteria including cold tolerant Clostridium botulinum
- Rapid cooling prevents growth of heat resistant surviving pathogens such as Bacillus cereus

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



The enquiry:

A year or so after the initial project a phone call from our client revealed that the business had grown – but a problem had arisen:

- One of their customers had rejected pre-packed soup products due to "masses" of mould growing on the top surfaces.
- Our client was wanting to know what could be done or added to the soup 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 changed, so as to speed up the cooling stage lidding was done after cooling.



What went wrong?

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

- In vegetables and vegetable soups, we should expect the presence of mould spores that can survive the heating stages,
- however the process of "hot fill & seal" reduces air levels and so moulds cannot grow as they're aerobes.
- By changing the process by cooling unsealed (instead of sealed) 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 that could be in their production rooms.
- Reverting back to the original safer process design: "*hot fill – lid & seal – cool*" should work.
- A 4hr cooling stage is generally accepted as good practice, so changing from 2hrs to 4hrs is OK
- That if desired, cooling times could be reduced by using a cold mains water spray prior to rapid air cool.

Follow up:

A phone call revealed that the simple solution described during the phone call – had worked and all parties were happy.