Quality in Sample Packaging and Why it Matters

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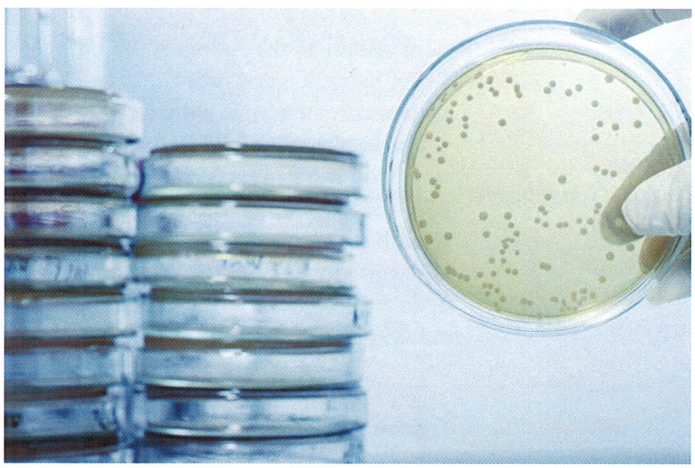
Perhaps the most easily overlooked quality aspect of environmental sampling is proper packaging. The most seasoned technicians with beautiful aseptic technique can end up with contaminated samples due to improper packaging. Just as proper technique at the site prevents contamination of sample plates from the technician, proper packaging prevents potential growth from one plate contaminating another plate, as well as contamination from external environments during shipping and breakage of plastic plate casings. As technicians, we must be aware to continually avoid contamination due to sampling and packaging errors.

Aseptic techniques must be employed during packaging of samples. Condensation is one of the most likely sources of contamination to plates. Media must be at room temperature before sampling and this can lead to condensation buildup. If you receive media that contains heavy condensations, do not remove the plates. Open the packaging and place in a BSC if available; allow the filtered air to dry the plates and the bags. Another way to eliminate condensation from the packaging is to store that plates upside down at all times. This prevents the moisture from accumulating in the lid and prevents the media from drying out.



The proper procedure for packaging samples is as follows:

- Spray your gloves with 70% IPA, or similar, and allow to dry prior to transferring the samples. Take extra time to avoid touching the inside of the sterile packaging you are using while placing the plates. This will help to avoid contamination of the sterile bag which can transfer to the samples in transit.
- Sterile packaging should be provided with the media and should be used to ship the finished samples. Lids may be secured with a small amount of tape or parafilm. Make sure the plates and the packaging are dry.
- Close the bag with a twist tie or tape.
- Place the bags of media in a secondary bag or container.
- Place any paperwork in a separate bag.
- Obtain an insulated shipping container. Place an ice pack- not dry ice or actual ice- in a clean, dry plastic bag at the bottom of the box. There is no substitute for an ice pack. Do not try to engineer a better ice pack; this can lead to a host of other issues. Never place your samples directly on top of an ice pack or vice versa. The plates need to stay cool enough to slow growth and avoid drying out but you want to avoid freezing or cracking the agar which will ruin the media.
- Cover the ice packs in any insulating packaging material such as bubble wrap and then place the samples on top. Place additional packaging material on top of the samples- enough to avoid any jostling or movement. Bubble wrap, or similar, is preferred to fill space as it creates a dead air layer for insulation and acts as a cushion to protect the plates.
- Place any paperwork inside the insulated container with the media.
- Close the shipping container. If re-using a shipping container, be sure to remove all old labels.
- Send overnight to the laboratory.

Correctly packaging our samples with ice packs proves to be one of the most difficult steps of this process. Do not think that sending samples without ice packs will help to avoid this issue. Helping to slow the growth of the organisms in transit is a very important step and ice packs also help the media from getting too warm, which can render the samples invalid. The incubation parameters set forth in the USP are very stringent. Shipping without ice packs may allow the organisms to begin replicating which can result in overgrowth and contamination of the other samples.

Isolating the source of growth on environmental monitoring samples is muddled by potential sources of contamination. Sampling sites will need to be investigated if there is an exceeded level of growth. Packaging will be a factor in differentiating between a true exceeded level and contamination. The time and expense of these investigations can be mitigated by continued diligence of aseptic techniques and packaging. We risk the loss of time and energy when samples are rendered unusable because we allowed the mundane nature of packaging distract us from the consequences of not maintaining the quality of our work throughout our processes.

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