

Standard Plate Count

Introduction to the Use of Standard Plate Counts in Mink Feed Kitchens

Standard Plate Count (SPC) is a common microbiological test used in mink feed kitchens for monitoring quality of individual feed ingredients, as well as complete diets. SPC indicates the number of bacterial colonies growing on a non-specific solid nutrient agar (medium) after a given period of incubation. This count can sometimes be used to indicate the microbial quality and spoilage level of the feed or ingredient in question.

How is an SPC performed?

A sample of product is blended in an appropriate solution and aliquots of the suspension, after dilution as necessary, are applied to the medium. The inoculated plate is incubated under required conditions and after a specified time, the number of visible colonies is counted. The results are typically expressed as colony forming units (C.F.U.)/g. or /mL.

What is the purpose of an SPC?

Obtaining an estimate of the number of microorganisms in a feed product can be used to evaluate sanitary practices during processing and handling. It can also be used to determine potential sources of contamination by testing line samples taken at successive stages of receiving, storage, processing, transport, and feeding. Selective testing for pathogens, is costly, time consuming and risky. SPC is generally a cheaper and quicker test.

What are the limitations?

- SPC measures most microbiological growth, but does not differentiate between the naturally occurring bacteria, yeast, molds, etc. and the pathogenic or spoilage organisms.



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- While a high SPC may be used as an indicator of poor sanitation, inappropriate storage, or problems with process control, it does not determine the presence of pathogens (to humans or animals).
- A low SPC, likewise, does not guarantee samples are pathogen free.
- SPC does not measure the entire bacterial population, but rather the number of microbes that grow on the specific medium under particular growing conditions.
- The type of bacteria that is present is not known - it might be good, it might be bad.
- The medium/agar may not support growth of certain pathogenic bacteria.
- It is difficult to distinguish between feed particles and bacteria.
- It cannot be used on fermented ingredients like cheese.
- Bacteria colonies may be too small to be seen. Conversely, the colonies can be overcrowded or clumped together, increasing error in reporting.
- Careful consideration must be given to the agar or medium being used, temperature and time of incubation, length of time and storage conditions of samples, potential contamination of samples, proper dilution of the sample to avoid overcrowding of colonies on plates, etc.

Summary

While SPC can be done on anything, the resulting info might be meaningless. For example, if you were to test cheese, which is produced by culturing dairy ingredients with “good” bacteria, the results would be off the charts - perhaps as high as 50 million. What you’re seeing is actually good bacteria as cheese requires bacteria in order to ferment properly. The same applies to yogurt, wine and other fermented products.

A quick look at the FDA guidelines for seafood for human consumption indicates that the maximum recommended SPC for clams, mussels, crabs, shrimp and other shellfish is in the $10^5 - 10^7$ range (100,000-10,000,000)! The numbers can look far more alarm-

ing than they, in fact, really are. When a high SPC occurs, plating a sample of the same ingredient on selective media to look at coliforms, staph, yeasts/molds or even a particular strain of culture may be required.

Standard Plate Count (SPC) is useful to monitor process control and determine sources of contamination, but is not a true measure of specific risk pathogens in feed or of overall feed quality.

References

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