Sterilization of Broth Media by Tyndallization

The most effective and simplest method for sterilizing broth media is to heat liquids to 121º C for 15 minutes using a pressure cooker or autoclave. This is because very high temperatures are required to kill bacterial spores. However, there is a low-tech way to sterilize media, even if there are spores present. This is called tyndallization. Tyndallization relies upon the germination of spores to form vegetative cells that can then be killed at 100º C. This germination is accomplished by heating the medium to 100º C for 15-30 min on three consecutive days. After boiling, the broth medium is incubated at 37º C overnight to allow the heat-shocked spores to germinate into vegetative cells. Then, when the broth is boiled the next day, the vegetative cells are killed. The boiling and incubation are repeated three times to ensure that all spores germinate. While this was once considered a means for sterilization, it is not used much today. One problem is that if there are many spores in the broth, you can get significant growth of bacteria. While those cells are killed by the next boiling step, the dead cells remain in the medium. Another problem is that this procedure only works for broth media that support the growth of spore-forming organisms. It is not useful for sterilizing water or buffers.

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