



GROWTH & STERILITY TESTING IN QUALITY CONTROL OF MICROBIOLOGICAL CULTURE MEDIA

1. Introduction

Culture media play an important role in any microbiology laboratory for isolation, identification and sensitivity testing of different pathogens to cure the infections. To ensure the culture media is made of good quality and capable of giving satisfactory results, quality control parameters such as growth supporting characteristics, physical characteristics and sterility testing are essential components. **Media quality control needs to be made at each batch production.**

2. Procedure

Media performance is checked by inoculating standard strains and incubating it at the desired temperature. Whenever a new batch of media is prepared, 10% of samples should be projected to sterility testing.

1. Sterility Testing

Every media prepared, following stringent quality control parameters is sterile.

- At least **5-10%** (5% for small batch ~50 plates and 10% for large batch >100 plates) of a new batch prepared should be **incubated at 37°C for 48 hours** to ascertain that there is no growth or contamination.
- If any colonies develop after incubation, the whole batch needs to be discarded.

2. Growth Testing

After sterility testing, media are also needed to test for supporting growth and giving reactions of the desired microorganisms.

- Inoculate the standard control strains into the new media as described in the following list:
- **Incubate at 37°C for 18-24 hours** and observe if the growth is typical. If one growth is not typical, the entire batch needs to be discarded.

N°	Media	QC strain to be used	Expected output
1.	MacConkey agar	<i>Escherichia coli</i> (ATCC® 25922™)	Lactose fermenting pink colonies
2.	MacConkey agar	<i>Acinetobacter baumannii</i> (ATCC® 19606™)	Non-Lactose fermenting pale colonies
3.	Mannitol Salt agar	<i>Staphylococcus aureus</i> (ATCC® 25923™)	Golden Yellow colonies
4.	Blood agar	<i>Streptococcus pyogenes</i> (ATCC® 19615™)	Beta haemolytic, grey colonies
5.	Blood agar	<i>Streptococcus pneumoniae</i>	Alpha haemolytic, small greenish colonies
6.	XLD agar	<i>Shigella sonnei</i> (ATCC® 25931™)	Red pink colonies
7.	XLD agar	<i>Salmonella enterica</i> subsp. <i>enterica</i> (ATCC® 14028™)	Red pink colonies with black centre
8.	Mueller hinton Agar	<i>Pseudomonas aeruginosa</i> (ATCC® 27853™)	Flat serrated greenish colonies
9.	Thayer martin agar	<i>Neisseria gonorrhoeae</i> (ATCC® 49226™)	Water droplet like colonies
10.	Bile esculin agar	<i>Enterococcus faecalis</i> (ATCC® 29212™)	Small transparent colonies with brown-black halos.
11.	EMB agar	<i>Escherichia coli</i> (ATCC® 25922™)	Blue-black bull's eye like colonies with green metallic sheen

Notes: One strain can be inoculated on various other media. Mostly, *Escherichia coli* (ATCC 25922), *Staphylococcus aureus* (ATCC 25923), and *Pseudomonas aeruginosa* (ATCC 27853) are used as cumulative control for testing all media.



Figure 1: Quality control example of MacConkey agar (Sterility & Growth)

References

- <https://microbeonline.com/quality-control-of-microbiological-culture-media/>
- [ATCC: Quality control strains used in microbiology culture medium](#)