

Difference Between Nutrient Agar and Nutrient Broth

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Key Difference - Nutrient Agar vs Nutrient Broth

Microorganisms are grown on culture media. There are various types of media such as solid media, semisolid media and liquid media. These media are prepared according to the purpose of growing microorganism. The nutrient medium is prepared for growing [bacteria](#) in laboratories. It contains several ingredients including a [nitrogen](#) source, [proteins](#) source, water, and NaCl. [Agar](#) is a substance which is used as a solidifying agent in media preparation. Nutrient liquid medium or nutrient solid medium can be prepared with or without adding agar. If agar is added to the nutrient medium, it is known as a nutrient agar medium. If agar is not added to the nutrient medium, then it is known as a nutrient liquid medium or a nutrient broth. Hence, the key difference between nutrient agar and nutrient broth is that **nutrient agar contains agar** while **nutrient broth does not contain agar**.

What is Nutrient Agar?

Nutrient agar is a general purpose medium which is used to grow bacterial species. It supports the growth of non-fastidious microorganisms. It contains several ingredients such as a nitrogen source, vitamin source, carbohydrates, and a solidifying agent.

Preparation of Nutrient Agar

Necessary soluble ingredients are measured and dissolved in distilled water. Then the pH of the medium is adjusted using HCl or NaOH. Once the pH is adjusted, the volume is topped up to the correct volume. Agar is added to the prepared suspension and autoclaved. Once the medium is [sterilized](#), it can be poured into sterilized petri plates to grow bacteria in laboratories.

Nutrient agar medium composition per liter is as follows.

Peptone	5 g
Yeast extract	1.5 g
Beef extract	1.5 g
Nacl	5g

Agar	15g
pH	7.4 ± 0.2

Nutrient agar is routinely prepared in microbiology laboratories to grow bacteria for isolation, characterization, identification, DNA isolation, etc. Nutrient agar is also used to maintain bacterial cultures in the labs.

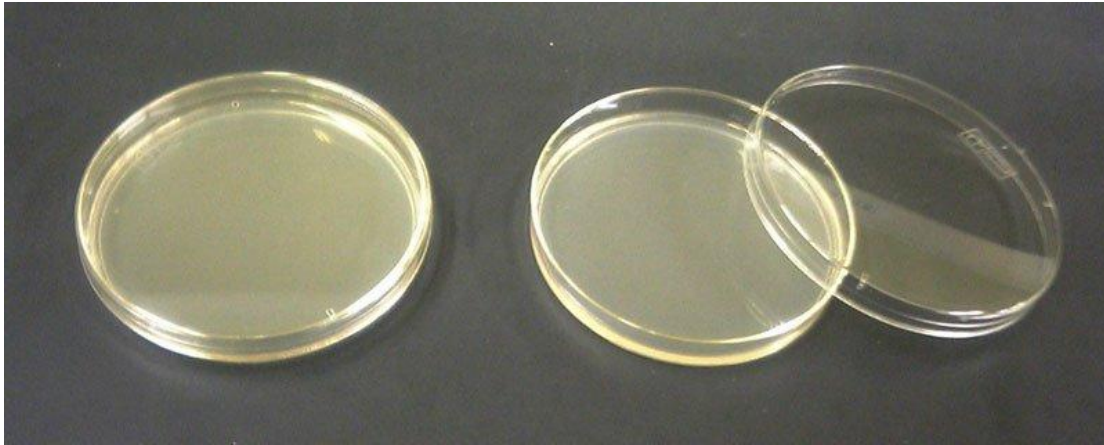


Figure 01: Nutrient Agar Plate

What is Nutrient Broth?

Nutrient broth is a liquid medium which is prepared to grow a wide variety of bacteria in the labs. The composition of the nutrient broth is the same as the nutrient agar except for the addition of agar. Agar is not used since it is a solidifying agent. Both nutrient agar and nutrient broth are amber colour after preparation. Nutrient broth is convenient than nutrient agar as most bacteria are grown in liquid media. Nutrient broth is used to study different oxygen requirements of bacteria. For example, not all bacteria need oxygen; some bacteria are poisoned by oxygen while some require only small amounts of oxygen. These requirements can be easily understood when they are grown in nutrient broth tubes. Based on the oxygen requirement shown by bacteria, bacteria can be classified into several groups such as obligate aerobic bacteria, obligate anaerobic bacteria, aerotolerant bacteria, microaerophilic bacteria and facultative aerobic bacteria.



Figure 02: Nutrient liquid medium in test tubes

What is the difference between Nutrient Agar and Nutrient Broth?

Nutrient Agar and Nutrient Broth	
Nutrient Agar is a solid medium which is prepared to grow a wide variety of bacteria	Nutrient Broth is a liquid medium which is prepared to grow a wide variety of bacteria.
Composition	
Nutrient Agar contains peptone, yeast extract, beef extract, NaCl, agar, and water.	Nutrient Broth contains peptone, yeast extract, beef extract, NaCl, and water.
Presence of Agar	
Nutrient Agar contains agar for solidification.	Nutrient Broth does not contain agar.
Properties	
Nutrient Agar is a solid medium.	Nutrient Broth is a liquid medium.
Glassware	
Nutrient Agar is poured into petri plates, culture bottles, test tubes, etc.	Nutrient Broth is poured into culture bottles, test tubes, etc.

Summary - Nutrient Agar vs Nutrient Broth

Culture media are prepared to grow microorganisms. They can be solid or liquid media. Nutrient agar and nutrient broth are two types of media which are prepared in the same way and contain more or less same composition. The main difference between nutrient agar and nutrient broth is the addition of agar. Both media are used to grow a wide variety of non-fastidious bacteria in laboratories.

References:

1. Aryal, Sagar. "Nutrient Agar: Composition, Preparation and Uses." Online Microbiology Notes. N.p., 08 May 2017. Web. [Available here](#). 20 June 2017.
2. "Growth medium." Wikipedia. Wikimedia Foundation, 28 Apr. 2017. Web. [Available here](#). 20 June 2017.

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APA: Difference Between Nutrient Agar and Nutrient Broth. (2017, June 05). Retrieved (date), from <http://www.differencebetween.com/difference-between-nutrient-agar-and-vs-nutrient-broth/>

MLA: "Difference Between Nutrient Agar and Nutrient Broth." *Difference Between.Com*. 05 June 2017. Web.

Chicago: "Difference Between Nutrient Agar and Nutrient Broth." *Difference Between.Com*. <http://www.differencebetween.com/difference-between-nutrient-agar-and-vs-nutrient-broth/> (accessed [date]).



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