It's the small things in life: Part 2 – Chicken and… microbes?

Technician notes

The issue

The Earth's resources are limited, but the human population is growing fast. How can we ensure food security – adequate safe, healthy food – for everyone?

This investigation can serve as a lead-in to discussions on the efficiency of eating meat and on the components of a healthy diet. Food safety and some basic microbiological techniques are introduced. Students examine the effect of temperature on the viability of yeast, before applying this to the microbial load on the food they eat. These activities can act as an introduction to the microbiomes (the microbes that live in a given ecological niche, and the sum of their genomes) of different species and their significance in human health and sickness.

Aim

The aim of the practical investigation is to explore the effect of temperature on the viability of microbes and to link this to the importance of cooking chicken thoroughly to minimise the likelihood of food poisoning. In this investigation students will use yeast as a safe proxy for the chicken microbiome.

The investigation is part of a wider set of activities looking at chicken consumption and husbandry worldwide. It comes in two parts; this is part 2.

Investigation: Counting microorganisms after heat treatment

Planning

You should have a set of 4 petri dishes (agar plates) from part 1, labelled with varying temperature, for each group of students. These agar plates have been inoculated with treated yeast suspensions and incubated for at least 3 days at 20–25°C.

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Safety

Technician carrying out preparation:
The work should be carried out over an impervious surface, which is wiped down before and after the practical with a 1% bleach (sodium hypochlorite) disinfectant solution. A simple way of doing this is to soak a plastic-coated surface (such as a laminated piece of paper) in a tray containing a shallow layer of 1% bleach for 15 minutes, then blotting it dry. After the practical work, the sheet can be returned to the tray, and there is no need to disinfect the bench surface.

After part 2 of this investigation, all petri dishes (agar plates) must be autoclaved without being opened before disposal.

The Microbiology Society offers safety guidelines for schools on its website: **www.microbiologyonline.org.uk/teachers/safety-information/**.

Students: Good hygiene is vital when handling microorganisms.

Wash your hands thoroughly with liquid soap before and after the practical work.

Wear eye protection.

Never open an agar plate once you have added the microorganisms and sealed it.

Equipment

From part 1:

- set of 4 incubated petri dishes (agar plates) for each group of students

From the kit:

- acetate counting grids
- chinagraph pencil/marker pen

You will also need:

- squared paper

Safe disposal

Disposal after the session

After this second practical session is complete, steam-sterilise all plates for 15 minutes at 121°C in an autoclave without opening them, and dispose of them well-wrapped along with normal refuse.

Method

See the student activity sheet for a description.