

# SCIENCE & FOOD TECHNOLOGY

## TEACHERS' NOTES

## DISCUSSION ACTIVITY & PRACTICAL:

## DOES YOUR CHICKEN HAVE WHITE STRIPES?



# TEACHERS' NOTES - WHITE STRIPING PRACTICAL



*Chicken breast fillet with white striping (long fine lines where muscle fibres have turned to fat and connective tissue)*

- White striping - a side-effect of breeding for faster growth and larger breast muscles in chickens
- Students learn to identify white striping from photographs or bought samples
- Students carry out survey in real or online supermarkets for homework – is white striping more common in intensively reared chicken?
- Film/s stimulate discussion about intensive farming and alternatives
- Booklet helps students discuss advantages and disadvantages of selective breeding

## CURRICULUM LINKS

**Science.** KS4. The importance of selective breeding of plants and animals in agriculture. Advantages and disadvantages of selective breeding and its ethical implications.

**Food Technology.** GCSE Food Provenance.

## LEARNING OBJECTIVES

Food provenance. Impact of intensive chicken farming and its alternatives on cost, chicken health and welfare, nutritional quality and other sustainability issues.

A case study of selective breeding and its impacts.

Selective breeding of chickens – the advantages and disadvantages; the ethical implications.

Efficient human food chains.

## PRIOR KNOWLEDGE HELPFUL

Intensive production of chickens and its alternatives.

Selective breeding in animals.

Efficient human food chains.

However, these can be covered whilst using these resources.

## RESOURCES

Introductory worksheet which connects with PowerPoint presentation.

Teachers' notes.

Classroom discussion booklet with information for further research.

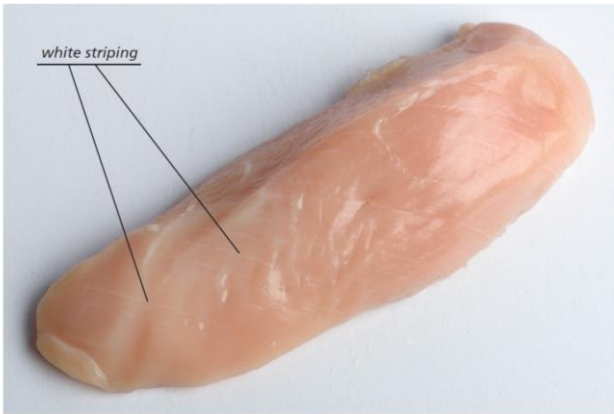
Supermarket worksheet (optional – students may plan their own recording method).

Film about intensive farming and its alternatives – can be shown whole film or section on chickens.

Consumer Campaign film by Compassion in World Farming USA where passers-by are asked about white striping – discusses human health and animal welfare implications.

# OVERVIEW

## CAN YOU IDENTIFY WHITE STRIPING IN CHICKEN BREAST FILLETS?



Standard intensive chicken breast (Red Tractor certified)

The chicken breast above has white striping. The white stripes are muscle fibres which have degenerated or died as the chicken has grown. The muscle fibre has been replaced by fat and connective tissue.

1. How many stripes can you see in this chicken breast?

You can check your answers at the end of this worksheet.  
A PowerPoint presentation showing complete chicken breast fillets is available at [ciwf.org/whitestriping](http://ciwf.org/whitestriping).

p1 of introductory worksheet.

White striping is a muscle disorder (myopathy) which is more prevalent in chickens which have been selectively bred for faster growth and for larger breast meat muscles. Effectively, muscle fibres degenerate or die and turn into fat and connective tissue, leaving very fine white stripes across the breast fillet.

Students learn how to identify white striping from a worksheet supplemented by an introductory PowerPoint presentation. If representative samples of chicken breast fillets are purchased they can use these to identify the presence of white striping in intensive vs higher welfare chickens. A students' discussion booklet is available with information and discussion points for extended work.

We recommend introducing the subject in a previous lesson on different systems for producing animals using a range of resources including the *Farm Animals & Us* films (no 1 is suitable for secondary students up to the age of 15 or 16 and where a shorter film is preferred; no 2 goes into more depth for able students aged 14 and over).

One option is for students to devise a plan to visit a supermarket to check whether white striping is more common in standard chickens in a supermarket vs higher welfare chicken (RSPCA-Assured, free-range or organic). Standard chickens will be fast-growing breeds; higher welfare chicken usually comes from slower growing chickens.

This survey is carried out for homework either instore or online. If you use search terms such as "buy chicken breast fillets" you are likely to find white striping, perhaps surprisingly, in the promotional pictures. You could also collect representative photos of chicken packages in advance.

# SUGGESTED LESSON PLANS

Please note that both Lessons 1 and 2 could be used as standalone lessons if time is limited. They could also be carried out in reverse order.

## LESSON 1.

1. Show part or all of a film outlining different systems for keeping farm animals. We recommend:
  - For abler groups use [Farm Animals & Us 2](#) (up to 25 minutes).
  - The same film has a 3 minute section on meat chickens suitable for all abilities which starts 9 min 43 seconds in.
  - For a shorter film including an amusing section where pupils role-play intensive chicken production, use [Farm Animals & Us](#) (up to 17 minutes; this also has a short 3-4 minute section on meat chickens starts 5 min 48 seconds in and another short piece on alternative chicken production at 16mins 10 seconds). Alternatively, show the 3-minute section of *Farm Animals & Us 2* now and use the shorter film in the next lesson as part of a deeper discussion.
2. Discuss their views on different methods of food production (pigeon, eggs, chicken and/or dairy). If you just showed the meat chicken section, then concentrate on methods of producing chicken.
3. Discuss the concept of selective breeding and how chickens have been bred to grow faster.
  - Why is this done? (cheaper chicken; uses less feed to produce meat etc.).
  - What are the consequences for the chicken? (animal welfare; lameness; heart disease, fatigue, reduced movement, etc.).

## LESSON 2.

If using this as the first or as a standalone lesson, we recommend starting with a three-minute excerpt from the *Farm Animals & Us 2* film to introduce the concept of fast-growing chickens and the impact of fast growth on production and welfare.

You can access the clip at <https://www.youtube.com/watch?v=-yP-L5H3KMg&t=9m44s> (the same link is available at slide 21 in the PowerPoint). This link takes you 9 minutes 44 seconds into the film where the section on meat chickens starts. Stop after about 3 minutes when the section on chickens finishes (it goes on to cows at 12m54s).

1. Introduce the concept of **white striping**. This occurs when a muscle fibre in a chicken's breast degenerates or dies and turns to fat and connective tissue. It is said to happen most often in fast growing birds bred with larger breast muscles where the rate of growth cannot be properly sustained.
2. (optional) Show a 2-minute consumer campaign film produced by Compassion in World Farming USA which questions the health and welfare aspects of chicken meat with white striping.

We think it is an engaging way of introducing the topic, but please make clear that this film is designed to express a point of view. The rest of this presentation and the discussion activity booklet are designed to encourage students to form their own views. This film could also be used as a follow-up once the students have developed their own opinions and to promote further discussion. Link is at

[https://www.youtube.com/watch?time\\_continue=4&v=F9wraGNyl28&feature=emb\\_logo](https://www.youtube.com/watch?time_continue=4&v=F9wraGNyl28&feature=emb_logo).

There is also a link embedded in the PowerPoint presentation and you may prefer to leave this till later and use within the PowerPoint.

3. Hand out the white striping introductory worksheet (illustrated on previous page) and ask the students to work through this. If any finish the five discussion questions early you can hand out the Students' discussion booklet to help them with the research questions (or alternatively to work through the questions in the booklet). If short of time you can leave 3 out and go straight to no 4 which goes over the worksheet.
4. Work through the white striping PowerPoint presentation which helps give answers to the questions in the worksheet and goes on to discuss chicken welfare issues in more detail.
5. Students design a survey to check the level of white striping in breast fillets and whether it varies between standard (intensively reared) chickens vs higher welfare chickens kept to RSPCA-Assured, free-range or organic standards.
6. Students visit a local supermarket for homework and carry the survey out. A worksheet is available to fill in results, though you may prefer students to work out their own recording method.

We recommend allocating a maximum of one group of students to carry out the survey in any one supermarket. Students should seek permission to carry out the survey at Customer Services first. Stress the importance of handling any packages with care, sanitising hands and not annoying the supermarket and other shoppers. One option might be to take photos, with permission, to minimise handling. Students may be able to obtain some results without touching any packages. Results to be discussed in a subsequent lesson.

Useful results may also be obtained from an online survey of breast fillets in supermarkets. A collection of representative photos collected in advance could also be used.

Alternative research homeworks for other groups are suggested in the students' discussion booklet or the introductory worksheet.

Treat vegetarians and vegans in the class sensitively and make clear that any students with conscientious objections can opt out of any survey.

7. Early-finishers to work through the discussion activity booklet.

Alternatively, if internet access is available, students can carry out a survey of chicken breasts on sale at online supermarkets. Is there a difference between the pictures of standard, free-range and organic chicken breasts?

At the time of writing, supermarket photographs include chicken breasts with white striping. This may change!

## LESSON 3.

1. Share the results of the surveys. This can be done on the whiteboard, on a spreadsheet or on paper. We suggest you adapt the table in the student worksheet.
2. Hand out the discussion booklet and ask students to continue to work through this whilst they are waiting for results to be shared.
3. Once the results are in, discuss them. Students can write the survey up.

4. There may now be an opportunity to show more of the Farm Animals & Us 2 film (or the Farm Animals & Us one) and/or hold a discussion. You may wish to go through the discussion points in the booklet.
5. Homework. Complete write-up or write an essay about selective breeding of chickens and its ethical consequences; or, how should we selectively breed chickens in future?

Point out that selective breeding could be used to improve the health and welfare of chickens and their nutritional content as well as for faster growth.

## ADDITIONAL TEACHING IDEAS

1. Students to prepare for a debate on the case for and against cheap intensive chicken production to be conducted in a future lesson.
2. Carry out further research into other related topics, e.g.:
  - a. Breast myopathies in chickens. Other examples include wooden breast and spaghetti meat.
  - b. Selective breeding of chickens for meat, hens for eggs or cattle for milk.
  - c. Welfare issues in meat chicken production.
  - d. Survey frequency of hock burns in supermarket chickens. You can find pictures of these readily online (search term "hock burns in chickens", then choose images).  
These are ammonia blisters caused when birds lie in poorly managed litter full of bird droppings. Is it more common in certain systems, eg standard intensive, free range or organic? Is size of bird a risk factor? Include in the count any chickens which have had their hocks chopped off which may be due to bad hock-burns.
  - e. Research suggests that white striping is also more common in larger chicken breasts. If students record the number of fillets per packet and the packet's weight, it may be possible to investigate this point separately. Are higher welfare fillets lighter? If some higher welfare fillets have white striping, are they larger fillets?

## FURTHER RESOURCES

Please keep an eye on Compassion's education website – [www.ciwf.org/education](http://www.ciwf.org/education) - for any new resources on this and other farm animal welfare topics.

## COMPASSION IN WORLD FARMING

Compassion in World Farming was founded in 1967 by Peter Roberts, a dairy farmer who could see first-hand how the demand for supposed cheap food was having a devastating effect on farm animals, the environment and humans.

Our educational resources are designed to encourage children to learn and think about the impact of the food they eat on the welfare of animals, people and the planet.