

Regulation of the Dairy Industry: Looking at the Science



By Smartshiva via Wikimedia Commons

Activity Overview

In this activity students will learn about the use and regulation of hormones to increase agricultural production in Canada. Specifically students will examine how recombinant bovine somatotropin (rBST) is produced and how it increases milk production. Students will learn how science has shaped legislation regulating the use of rBST.

Curriculum Connections

This activity is designed for the Biology 30 curriculum but also has connections to Social Studies. It has the following learning outcomes:

- To evaluate the use of biotechnology to increase milk yields using synthetic hormones.
- To reflect on the role of science and technology in society

Time Required

Approximately 80 minutes

Materials Required

- Student handouts
- Computer access for research

Lesson Format

- Pre-discussion
- Role Playing Activity
- Reflection and Discussion

Pre-requisite Knowledge

- Basic understanding of hormones and how they function

For the Teacher

Background Information

Hormones are used in beef cattle in Canada to increase production and feed efficiency. There are currently 6 hormones approved for use in Canadian cattle.

A synthetic version of a naturally occurring growth hormone called somatropin has been developed to increase milk production in cows. This synthetic hormone is called recombinant bovine somatropin (rBST). Health Canada has reviewed the use of rBST to produce milk and for human consumption. Health Canada has deemed milk from cows treated with rBST as safe for human consumption. rBST is not approved for use in Canada because of health concerns for livestock.

According to Health Canada there has not been any scientific proof of dangers to consumers but a quick internet search can provide conflicting messages. This is a good opportunity to discuss with your students what types of sources are reputable.

For more information you can read a statement from Health Canada about the use of hormones in cattle on this web page: http://www.hc-sc.gc.ca/dhp-mps/vet/faq/growth_hormones_promoters_croissance_hormonaux_stimulateurs-eng.php

Instructions

Pre-discussion

1. Ask the students what they know about hormones and food and make a web on the board
 - a. Include misconceptions and address why they are wrong.
 - b. Some prompts include
 - i. What living things use hormones?
 - ii. How could manipulating hormones increase agricultural production?

- iii. Could there be consequences to hormones in agriculture?

Activity

2. Place students in small groups representing a scientific advisory committee for a fictitious country.
3. Distribute the student materials and provide time for the students to complete their task of writing legislation regulating rBST in their country.

Reflection

4. When the groups are finished drafting their legislation have a member from each group share a summary of their legislation with the class.
5. Ask the students why some people might be concerned about drinking milk produced using rBST despite Health Canada assurance that it's safe for human consumption.
6. Discuss how students feel about the issue. Did their opinions change as they did more research? Were there conflicting opinions within the groups?
7. Ask why it is important for science to inform government legislation?

Assessment

Assessment criteria are found in the student handout materials

Extension Activity

There are six hormones approved for use in Canadian cattle. Divide students into small groups to study one of the approved hormones and how they are used to increase production in cattle.

For the Students

A fictitious country is considering legalizing the use of hormones in milk production. The minister of agriculture has created a committee to prepare a report on the use of recombinant bovine somatotropin (rBST) in cattle. Currently the hormone is approved for use in some countries such as the United States but is not approved in others like Canada. As a member of the special committee your task is to prepare a report that explains the benefits and risks (if any) of the use of rBST. A sample template and assessment criteria for your report is included below.

Template

Introduction: Overview of rBST

In this paragraph give a brief overview of what rBST is.

- Describe how the hormone is produced.
- Explain how rBST increases milk production.

Body: Exploring the Issue

In the body of your report you will provide an analysis of the risks and benefits of rBST based on scientific evidence from reputable sources.

- What are some of the concerns people have about consuming milk produced using rBST? Are these concerns justified by recognized scientific evidence?
- Do the benefits of rBST outweigh any risks involved?

Conclusion: Recommendation for Legislation

In a short paragraph write a concise statement with your recommendation to the minister of agriculture.

- Propose new legislation and justify it by referring to relevant scientific research

Assessment

Criteria	Excellent	Proficient	Adequate	Limited	Insufficient
Evaluate the use of biotechnology, specifically the use of rBST to increase milk production in cows	Develops a position and uses evidence in a compelling manner to support position	Develops a position and uses evidence in a credible manner to support position.	Develops a position and uses evidence in a simplistic manner to support position.	Develops a position and uses evidence in an inconclusive manner that does little to support position.	Insufficient evidence of student performance.