

Background

Below is a list of case studies that you may use to write your internal on. However, you do have the freedom to find your own case studies if these don't interest you. If you do choose your own then ensure you check its suitability with your teacher before starting to write.

The articles below will mostly give you the **background** to each case study. Once you have identified the techniques that have been used within your chosen case study method (e.g. SCNT) then you will still need to go out and **do your own research** to explain the technique. Some of the journal articles in these lists *may* have some of this information, but not all. You will still need to research!

Method: Transgenesis

Case Study: Transgenic goats - harvesting therapeutic antibodies from milk (New Zealand example)

Encyclopedia Britannica: Transgenic goats overview

[https://encyclopedia.pub/entry/12272#:~:text=Generation%20of%20transgenic%20cloned%20goats,modified%20genes%20\(Figure%201\).](https://encyclopedia.pub/entry/12272#:~:text=Generation%20of%20transgenic%20cloned%20goats,modified%20genes%20(Figure%201).)

Journal paper: transgenic goats

<https://pubmed.ncbi.nlm.nih.gov/33205005/>

AgResearch Report: NZ government subsidised agricultural research organisation that is producing transgenic goats

<https://www.epa.govt.nz/assets/Uploads/Documents/New-Organisms/Reports/GM-Field-trials/ERMA200223-2020-AgResearch-cattle-sheep-and-goats-10-year-report-Summary-and-Decision.pdf>

NZ Herald newspaper article:

<https://www.nzherald.co.nz/nz/how-genetically-modified-new-zealand-goats-could-help-fight-cancer/3A2XCXXQBNOI2J245QLYYZCBE4/>

Journal article on transgenesis in goats and sheep: different techniques

[Pdf here](#)

Khan Academy: cutting & pasting DNA

<https://www.khanacademy.org/science/biology/biotech-dna-technology/dna-cloning-tutorial/a/restriction-enzymes-dna-ligase>

Case study: Transgenic cows - Extra casein protein in milk (NZ example)

Science learning hub: gene construct

<https://www.sciencelearn.org.nz/resources/857-techniques-used-to-make-transgenic-cows>

Khan Academy: cutting & pasting DNA

<https://www.khanacademy.org/science/biology/biotech-dna-technology/dna-cloning-tutorial/a/restriction-enzymes-dna-ligase>

Science Learning Hub:

<https://www.sciencelearn.org.nz/resources/843-transgenic-cows-making-modified-milk>

AgResearch Report: NZ government subsidised agricultural research organisation that is producing these cows

<https://www.epa.govt.nz/assets/Uploads/Documents/New-Organisms/Reports/GM-Field-trials/ERMA200223-2020-AgResearch-cattle-sheep-and-goats-10-year-report-Summary-and-Decision.pdf>

Journal article on casein cows:

<https://www.nature.com/articles/srep37607>

Case study: Transgenic pigs that are environmentally friendly (USA)

CBS news:

<https://www.cbsnews.com/news/genetically-engineered-pigs-earth-friendly-poop/>

ABC news article: 'Enviropigs' / 'Frankenswine'

<https://abcnews.go.com/Technology/enviropig-ontario-canada-university-guelph-genetically-engineered-pigs/story?id=12555908>

Science Daily magazine article:

<https://www.sciencedaily.com/releases/2013/03/130307124802.htm>

Journal article:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5963925/>

Other transgenic case study to look into:

Atlantic Salmon (think back to the 'animal pharm' tv clip)

Method: Cloning

Case study: Black footed ferrets conservation (USA)

NGO - Revive & Restore Genetic Rescue organisation:

<https://reviverestore.org/projects/black-footed-ferret/>

USA government - Fish & Wildlife service:

<https://www.fws.gov/press-release/2024-04/innovative-cloning-advancements-black-footed-ferret-conservation>

Smithsonian Magazine:

<https://www.smithsonianmag.com/smart-news/scientists-clone-two-black-footed-ferrets-from-frozen-tissues-in-conservation-effort-180984203/>

Scientific American magazine article:

<https://www.scientificamerican.com/article/how-a-cloned-ferret-inspired-a-dna-bank-for-endangered-species/>

Journal article - Scnt of black footed ferrets

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1892907/>

Journal article: An ethical analysis

<https://www.sciencedirect.com/science/article/pii/S0006320721001701>

Case Study: Bulls/Cattle for dairy or meat - *MUST choose a specific part of the cow they are being cloned for i.e. a specific case study (USA)

Reuters news article:

<https://www.reuters.com/article/lifestyle/science/welcome-to-the-clone-farm-idUSTRE5AC07V/>

UGA college article:

<https://newswire.caes.uga.edu/story/740/cloning-quality.html#:~:text=for%20the%20future.-,Scientists%20cloning%20cattle%20in%20University%20of%20Georgia%20laboratories%20see%20their,beef%20more%20available%20for%20consumers.>

NZ Herald newspaper article:

<https://www.nzherald.co.nz/business/spectacular-results-predicted-for-cloning-top-breeding-bulls/FWVQUZ3TQKO47UN6XD5QEV6RFQ/>

Nature journal article:

<https://www.nature.com/articles/s41598-019-47909-8>

Journal article:

https://www.researchgate.net/publication/335000535_Successful_cloning_of_a_superior_buffalo_bull

Journal article: impact of cattle cloning

<https://pubmed.ncbi.nlm.nih.gov/15268796/>

Other cloning case study to look into:

Race horses (must pick specific example)

Method: Gene Regulation

Case Study: Possum gene drive

Predator Free NZ - NGO:

<https://predatorfreenz.org/research/gene-editing-pest-control/>

NZ Herald newspaper article:

<https://www.nzherald.co.nz/nz/nz-scientists-exploring-gene-editing-tech-for-possum-eradication/5KI2R5AUZ7ABAVJF74BUSLTZMI/>

Royal Society (scientific research organisation - privately funded): The site includes links to pdfs with more information

<https://www.royalsociety.org.nz/what-we-do/our-expert-advice/all-expert-advice-papers/gene-editing-for-pest-control/>

Otago University: Gene editing using CRISPR

<https://www.otago.ac.nz/biochemistry/research/gene-editing-in-new-zealand-research-with-crispr-cas>

Otago university: tracking possums

<https://www.otago.ac.nz/news/newsroom/critical-step-made-for-managing-brushtail-possums>

Nature magazine - Māori perspective on gene edition in Aotearoa:

<https://www.nature.com/articles/s42003-024-05896-1>

Te Herenga Waka (University of Victoria) - gene editing wild pests

<https://www.wgtn.ac.nz/news/2017/11/gene-editing-wild-pests>

Netflix: Unnatural selection - Overview of NZ possum case study on here

Other NZ case studies

AgResearch NZ research organisation:

On **page 2** of this document begins a list of GM projects that this government funded agriculture research organisation has carried out

<https://www.epa.govt.nz/assets/FileAPI/hsno-ar/ERMA200223/ERMA200223-2020-AgResearch-cattle-sheep-and-goats-10-year-report-Summary-and-Dcision.pdf>