Markscheme

1. Many possible answers, such as: salmon, pig, sheep, mosquitoes, cows

2. Many possible answers

3. frost resistance - genes for cold tolerance are inserted, allowing crops to withstand freezing conditions
drought resistance - genes for drought tolerance are inserted, allowing crops to survive in low water conditions and mitigate damaging effects
salt-water tolerance - genes for saline tolerance are inserted or amplified, allowing crops to be grown using salt water instead of freshwater
disease resistance - genes inserted to protect against viruses, bacteria or fungal infections

4.

	Advantages	Disadvantages / Risks
Economic	✓ GMOs with longer shelf life means less waste ✓ GMOs can be grown in a wider range of environments for longer - more yield ✓ GMO can grow larger - more yield ✓ GMO resistant to pests / viruses, less loss and less use of chemical pesticides - more yield and money saved	x patent protection allows biotech companies to restrict the use of seeds and force farmers to pay a high price for their use
Environmental	✓ with pest-resistant crops, less chemical insecticides need to be used ✓ increase in yield means less land needed ✓ GMOs can be grown in a wider range of environments for longer - less need for deforestation	x non-target organisms can be affected x genes transferred to crops can spread to wild plants, creating super weeds x herbicide-resistant crops encourage herbicide use x GMO can compete with native wildlife, reducing biodiversity x Pest / herbicide resistant crops could accelerate resistance in insects and weeds
Human health	✓ improve nutritional standards ✓ GM crops can be made that lack allergens or toxins ✓ edible vaccines decrease disease spread	x removal / addition of genetic material could cause adverse health reactions in individuals x not all foods with GM components are labelled, making informed decisions more difficult

MARIER