National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Exemplar for Internal Assessment Resource

Economics Level 3

Resource title: Micro-economics portfolio

This exemplar supports assessment against:

Achievement Standard 91401

Demonstrate understanding of micro-economic concepts

Student and grade boundary specific exemplar

The material has been gathered from student material specific to an A or B assessment resource.

	Grade Boundary: Low Excellence
1.	The student demonstrates a comprehensive understanding of micro-economic concepts, which is required for Excellence.

The Merit requirements have been covered, and for Excellence the standard also requires justification of the implications supported by models and data.

The student has justified detailed explanations of the implications for consumers and producers using numerical information and a quote from an article in The Press - 27/05/09. Refer to parts A.

One model has been presented and used to justify the explanation of the implication to consumers, and mentioned to support the statement that "This causes NZ producers who use sow stalls and farrowing crates to leave the market (see figure 1)", but the connection was not fully explained. Refer to part B.

The idea of a subsidy has been mentioned in the implications for the government, but not fully explained here or in the report. Refer to part C.

Additionally, there would be other implications if the NZ pork industry decreased in size; e.g. job losses, increasing unemployment leading to higher transfer payments for the government, as well as reduced revenue for other producers who rely on the NZ pork producers for income. Refer to part D.

A more secure Excellence would be attained if the above points were addressed, enabling a justification of all the implications for the producers. |

Student has also explained in detail micro-economic concepts using economic models and data and information.

Implications for producers

In New Zealand (NZ) there are three types of pork produced all having different variables which all have different implications for the producers. Economies of scale are reductions in the average cost of production that can be gained from producing on a larger scale, one of the main reasons that some NZ pork producers still use sow stalls. These can be a metal crate or cage, usually with a bare or slatted floor, which is so narrow the pig cannot turn around and can only stand or sit with great difficulty. They are deprived of the outside world and normal movement and activities in these stalls. Shortly after she is due to give birth, a sow is typically moved to a farrowing crate (www.ciwf.org.uk/farm_animals/pigs/welfare_issues/default.aspx). 40% of NZ pork producers will experience increased costs of production because of the new regulations put in by the government for 3rd December 2015 (NZ pork media release) who are aiming to remove all sow stalls in NZ. For example, it would cost these producers $266 per sow to follow the new regulations (pork industry pays the price article), so therefore if the firm had 500 pigs then it would cost them $266 x 500 = $133,000 and these pork producers may find it's no longer profitable for them to stay in this industry. Another implication for the producers that use sow stalls is that they will have to increase their prices by 4.5% to cover their increased costs and maintain profit. This will make them less competitive in pork production due to price elasticity of demand; consumers will not be willing to pay the extra 4.5% for this pork and may decide to purchase the substitutes e.g. imported pork. This causes NZ producers who use sow stalls and farrowing crates to leave the market (see figure 1) and possibly divert their resources into producing something other than pork, for example, they may decide to go into the dairy industry, which may be a more beneficial and profitable use of their resources.

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Figure 1: Decrease in supply in the NZ pork market
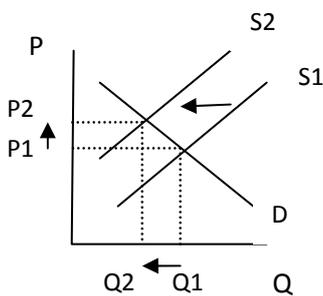
NZ producers using sheds rather than sow stalls or farrowing crates will not experience increased costs of production from the change in regulations. However, in the long term they will face increased costs of testing for PRRS (a disease that may come from importing pork, also referred to as aids in pigs). Our industry's science advisers say if fresh cuts are imported PRRS will enter NZ within three to five years (pork industry pays the price article). PRRS disease is transferred when heavily infected fresh pork is fed to healthy pigs. Therefore, NZ producers of pork using sheds needs to ensure their pork does not become infected with this disease and will need to regularly test for this. These pork producers will benefit if producers who use sow stalls increase their price 4.5% because their costs of production have not increased and they can afford to maintain their current price level and become more price competitive than other producers facing regulation changes. But they could increase their price level, increasing revenue, and afford to expand their business or put in more resources and invest in more pork production, creating economies of scale where their average costs of production decrease. Additionally, these pork producers using sheds face marketing costs like advertising "100% NZ grown pork". Consumers may be willing to pay a little extra if they recognise that the product is NZ produced instead of buying imported pork, and that the welfare of the pigs is improved because the crates are not used, and this may cause revenue for these NZ pork producers to increase.

Producers of fresh NZ free range pork don't face increased costs due to the new regulations because they do not use the sow stalls or crates; however they may face testing costs for PRRS. These costs will not be as high as the costs for NZ producers using the sheds because the disease will not be as common because they do not eat as much imported pork. For example, at our school we eat NZ fresh pork and give our food scraps to a free-range farmer. At the moment the PRRS disease is not found in NZ so the free-range pig farmer will not experience this infection in his pork, however if the restrictions on importing pork ease we may find if more than the current 40% of pork supplied is imported then the risk of disease within these pigs may increase. Free range producers will also face increased costs from marketing because they are trying to convince consumers that free range pigs have a better quality of life, as they are able to build nests, wallow and forage. The increased costs of production should be partly covered by increased demand from consumers who switch to buying free range pork for ethical reasons. North Canterbury

Organics owner said in an article from The Press-27/05/09 "orders for organic bacon had quadrupled this week, and she said she was waiting for more stock at her Rangiora shop", this increase was due to the television documentary showing sows in cramped cages, and consumers were opting to buy free range pork after seeing how the non-free range pigs were treated. Another implication for these producers is that as non-free range pork producer's costs increase by 4.5% they will become more price competitive as the price difference decreases and therefore more consumers may switch to free range pork. The free range producers may be able to expand their business, diverting more resources into the production of pork, increasing output so they can achieve economies of scale and become more efficient and profitable by lowering their average costs.

(A)

An implication for consumers is that due to the average weekly household expenditure on food being $177.70 as stated in previous blog, for households to consume 400 grams of free-range bacon this would be 12.49/177.7x100=7.03%, whereas for imported pork its 4.49/177.7x100=2.53% which is a smaller percentage of average household expenditure on food. This indicates it is more inelastic than free-range pork which is viewed more as a luxury good and would usually be substituted for the cheaper pork when households are on a limited budget. Marketing may help to increase awareness and make some consumers decide to buy the more expensive, but more ethical pork choice and pay a little more for NZ produced pork instead of imported pork. However, NZ consumers will have less NZ pork and it will be more expensive if some of our local pork producers are forced to leave the market because they find the industry no longer a profitable use of their resources and so supply of NZ pork would decrease as seen in figure 1 above, and market price increases for consumers from P1 to P2 and so quantity demanded falls from Q1 to Q2.

(A)

The government may also experience implications from the banning of sow stalls if some producers are no longer going to be profitable in this industry. The pork producers may put forward a case to the government of subsidising them so they can stay in business by helping them pay for their increased costs of production, arguing that if they go out of business this would have a negative effect on the money flow in the economy and company tax revenue received by the government would also decrease.

(C)

Summary
NZ produced pork is elastic and there are many factors affecting the elasticity of demand for NZ produced fresh pork, however the main factor is substitutes as there are many other alternatives for households to consume rather than NZ produced pork.
There are also many factors influencing the elasticity of supply for NZ produced fresh pork; however the main one is time period where in the long run we will experience the main changes in the economy because all inputs become variable.
The main implications for consumers purchasing NZ produced fresh pork is the price increase due to the government banning the sow stalls. This will make NZ pork less affordable for consumers.
The main implication for producers of NZ produced fresh pork is the forces of the market, if they are no longer profitable in this industry they may decide to divert their resources into another more profitable industry. Based on this study I see a decrease in the number of NZ fresh pork producers, but I do see free-range NZ pork becoming a real alternative to imported pork; however, if the price difference is not able to be narrowed then most consumers will not switch to the more expensive NZ pork options and the NZ pork industry will become even smaller than it is already.

(D)

	Grade Boundary: High Merit
2.	The student demonstrates an in-depth understanding of micro-economic concepts, which is required for Merit. The Merit requirements have been covered, and for Excellence the standard also requires justification of the implications supported by models and data. The student has used numerical information, an interview and a secondary source to justify explanations of the implications for consumers. However, the student has not used a model to support the justification. Refer to highlighted parts in E. To reach Excellence the student would need to justify the implications for producers with explanations (rather than statements) that are supported with data and/or information. Additionally, the student needs to use models to justify the implications, which is also required for Excellence. Refer to parts F.

Implications for consumers

If the government bans/reduces the sow and farrowing crates in NZ pork farms, this will cause the price of pork to increase by 4.5 per cent, because it will cost the producers an extra $266 per sow in production, which will rise the price from $1.65 to $1.73 per 100grams. This price increase of NZ pork will decrease the price gap between non-free range and free range pork so consumers may feel it's worth the extra cost for their ethics and health. Positive cross elasticity of demand (the responsiveness of quantity demanded of a good to changes in the price of another good) could affect the quantity of free range pork demanded because with the 4.5% increase in the other type of NZ pork, there is a positive relationship between the two, possibly causing the demand for free range pork to increase in response to the increase in the price of the NZ pork substitute.

Ethics plays a large part in the consumption of pork in NZ. Many consumers would rather buy free range pork because it's not only supporting the free range pork industry but they feel happy the pigs are treated well in life; one consumer I asked said that he would decrease his demand of general pork so he could afford to buy free range instead of supporting poor pig farming, as much of this pork is factory farmed and the pigs are usually in rather poor conditions.

Consumers may not be able to afford free range pork at its current price (because it is a luxury good) but if the price of NZ pork was to increase it would be less of a jump in prices between free range and other NZ pork so NZ consumers would be happier to purchase it and perhaps forego another good in their limited budget.

Health value of pork is another thing NZ consumers will consider when buying meat from the supermarkets. The NZ government has no power over what other countries legalise in their pork production (e.g. hormone additives, living standards). Growth hormones may be added to the pork imported into NZ from Australia, Canada, the US and China. This may be bad for the health of consumers and their families. One consumer I interviewed said that she would not purchase imported pork because she could not be sure of the safety of the meat (http://www.healthyfood.co.nz/articles/2007/july/ask-the-experts-imported-pork).

700,000kg of imported pork is purchased in NZ supermarkets per week. If fresh imported pork is allowed to be imported it could contain the infection Porcine Reproductive and Respiratory Syndrome (PRRS), and puts our pig herds at risk, which could devastate the NZ pork industry nationwide. If this information was advertised more consumers may decrease their demand for imported pork and support NZ's pork industry rather than risk destroying it.

Imported pork will appear relatively cheaper after the 4.5% increase of NZ pork, and so those that cannot afford the luxury of NZ grown pork may opt for this cheaper option. The consumers that are more likely to buy products that advertise 100% NZ grown, or free range as an ethical choice can afford to do so, but more will choose to as the gap between free range and other NZ pork decreases, and if this is advertised and marketed well it may also cause the demand of pork to become less elastic.

E

Implications for producers

The government ruling on removing (or reducing the use of) sow and farrowing crates in factory farms in NZ will increase the farmers cost of production by an estimated $266 per sow, they will have to lift their pork prices by 4.5% to not lose revenue. They need to raise their prices to maintain their profits and make it financially viable to remain pig farmers.

Free range pork prices will have become relatively more competitive with the increase in NZ pork prices (and the recent advertising of NZ pork living standards-sow crates) so "free range pork sales are soaring" (shoppers opt for free range pork-the press, 27.5.09). This increase in sales and therefore revenue will allow them to expand and develop more cost effective ways of free range farming because the demand for their product is now higher.

60% of NZ farmed sows are not in farrowing/sow crates (but are still housed in sheds). This means these farmers are unaffected by the NZ pork's $266 (Pork industry pays the price, over the fence-26.4.11) per sow increase in costs of production for the other 40% who will become less price competitive, and may be forced to leave the industry and put their resources into something more worthwhile like dairying or chickens. They could request a subsidy from the government to convert to non-sow crate farming and keep

the NZ pork market afloat to meet the demand of NZ consumers and not open up the market to more imported pork and the risk of PRRS. The 60% who do not face the increased costs of production could still increase their prices to increase their profits and gain from less competition in the market as other NZ pork producers are financially forced to leave. They could then expand their production, investing in more capital to achieve better economies of scale, decrease average costs in production as they become bigger. They could also invest in more marketing with the label 100% NZ grown pork to try and ==make demand for their==
==product less price elastic==, as consumers buy NZ made as opposed to imported pork.

Conclusion

The demand for pork is elastic, because it has several substitutes and a relatively high price and it is not a necessity, and the supply of pork is also elastic.
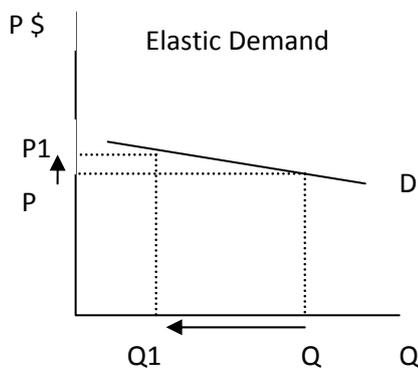
Based on this study, I see the future of NZ pork (particularly those using sow crates) being in jeopardy due to the phasing out of sow crates causing an increase in the costs of production and the luxury price of pork, which will decrease supply and therefore allow the market to be open to fresh imported pork (which is a cheaper substitute) which could potentially cause a crash in the industry due to PRRS.

	Grade Boundary: Low Merit
3.	The student demonstrates an in-depth understanding of micro-economic concepts, which is required for Merit. The Achieved requirements have been covered, and for Merit the standard also requires detailed explanations of micro-economic concepts supported by model(s) and data. The student has covered the theory of elasticity of demand and has used a model and data/information to support some detailed explanations. However, the student has not compared the different elasticities of demand using the pork context. Refer to part G. The student has briefly explained the theory of diminishing returns, but has not linked it to elasticity of supply. Refer to part H. Models, data or information have been used to support explanations of the theory of elasticity of supply, and a detailed explanation of its application to the pork industry. However, the link between the PPF model and elasticity of supply was not explained. Refer to part I. A more secure Merit would be attained if the above points were fully addressed and some of the explanations of micro-economic concepts were more detailed and consistently applied to the context of the NZ pork industry.

Theory-Elasticity of Demand

"Price elasticity of demand is the responsiveness of quantity demanded of a good or service to changes in its price"

There are three types of price elasticity such as elastic demand, inelastic demand and unitary demand. I believe free range pork is an elastic good. An elastic good is when the price of a good changes by a certain percentage and the quantity demanded changes by a greater percentage. This means that the quantity demanded (QD) is very responsive to price changes. In a graph form we can see that PxQ is greater than P1xQ1, which shows that the QD has changed by a greater percentage than the price change and will result in a large decrease in revenue for the producer. The slope of the demand curve is also very nearly flat to show a greater percentage change in the QD. This is elastic demand. From the figures collected from our survey the coefficient for free range pork is 6.27 *(student did calculation).* Because the coefficient is greater than 1 it means that the demand for free range pork is highly elastic. However different types of pork have different types of elasticity. Free range pork has a very high elasticity compared to NZ fresh pork and imported pork. Imported pork has much less elasticity compared with free range pork and NZ pork is more elastic than imported as well, but less elastic than free range pork. From the data collected at New World and Pak 'n' Save it is clear that there are differences in prices of types of produced pork. For free range produced pork the price for 600g is $18.75. The price for $600g NZ pork is $9.99 (on special) and the price for imported pork for 600g is $12.50. So people wanting free range pork specifically and their income is not necessarily high will either have to budget buying free range pork at a higher price or take it out of the budget and swop to a substitute such as imported pork or NZ pork as they are the cheaper options.

If free range pork increases in price it would be expected that there will be a more than proportionate decrease in the QD. This would mean that consumers would switch to substitutes of free range pork such as imported pork or NZ pork or completely substitute with chicken or lamb. This is a positive relationship and shows that if one good increased in price such as free range pork it would cause demand for the close substitutes to increase such as NZ produced pork or imported pork. This is the positive relationship of cross elasticity, which is the responsiveness of QD of a good to changes in the price of another good. To find the coefficient of cross elasticity it is the % change in the QD of a good divided by the % change in price of the other good. It is said that the larger the coefficient the stronger the relationship between the two goods. Therefore if the coefficient is large between free range pork and NZ produced pork or imported pork then there is a very strong relationship.

When interviewing a teacher at my school, Mrs S I asked her if she bought free range pork. Her response was "I would like to, but it is too expensive". She buys the cheaper option now and this statement supports my idea of pork being an elastic good, especially free range pork. This statement from Mrs S also links to income elasticity of demand, because this is defined as the responsiveness of QD of a good or service to changes in income. You can calculate and find the coefficient that tells us what type of income elasticity the good or service is by calculating the % change in the QD divided by the % change in income. If the coefficient is above 1 it shows that it is likely that the consumer will be able to purchase the luxury good free range pork as the income elasticity is high. Therefore it is fair to say that if Mrs S income increased she would purchase free range pork as she now has the income to purchase the good.

The graph is labelled:

P $ — Elastic Demand

P1, P on the vertical axis; Q1, Q on the horizontal axis; D is the demand curve.

(G)

Theory-Elasticity of Supply

"Price elasticity of supply is the responsiveness of the quantity supplied of a good or service to a change in price"

Elasticity of supply varies depending on many different factors such as the momentary period, short run, and long run. Momentary supply is defined as the immediate period of time where the only amount available of a good is that which is already in the market. The short run is where at least one factor is fixed whereas in the long run no factors are fixed, they all become variable. These time periods all influence what

type of elasticity that free range pork is, the coefficient of supply is calculated by % change in QS divided by % change in price. If the elasticity of supply is more than 1 it is elastic; exactly 1 then it's unitary, and if it is below 1 then the good is inelastic.

One of the factors that affect price elasticity of supply for free range pork is the momentary period. Momentary period means the immediate period in which the good is available, so even if the price for free range increased in the market, suppliers could not immediately increase the quantity supplied. Therefore we would say that free range pork is perfectly inelastic and the supply curve would be vertical as the QS is fixed because there is not enough time for suppliers to produce more resources (as seen in graph A).

Another factor that affects price elasticity of supply is the short run, where at least one factor is fixed which means you cannot change that particular input into the production process. For example land for the free range pigs, the amount of land a producer has in the short run will mean that if the producer purchased more pigs to increase QS they will experience diminishing returns. This is because they do not have the necessary land to house all of the free range pigs resulting in diminishing returns which is when the output per input is less. For this reason the producers will then put higher prices on the pork produced resulting in the supply curve having an upwards slope in the short run (as seen in graph B). ==Short run leads to diseconomies of scale due to the fixed factor and will eventually become less efficient in production of free range pork because the output is less than the input creating diminishing returns.== (H)

Long run is also another factor that affects the price elasticity of the QS for free range pork. Long run is when there are no fixed resources and firms can enter and leave the market. Firms have no limiting factors that will stop them increasing the QS and the production level as they have no fixed factors in their way such as land to house the pigs. Therefore the firm may experience economies of scale as the firm increases the scale of production such as increasing the amount of land, housing and free range pigs they have and it leads to a fall in the average costs of production. This is because there are efficiencies gained due to the spreading of costs over increased output. This results in the firm's supply curve becoming more horizontal in the long run which is also more elastic (as seen in graph C).
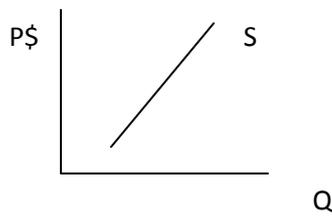
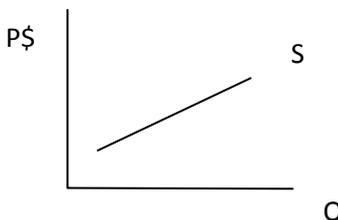**Graph A-Momentary Period**
Perfectly inelastic
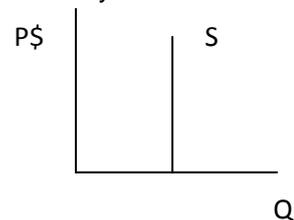
Graph B-Short Run
more inelastic

Graph C-Long Run
more elastic

There are three other factors that affect the price elasticity of supply for free range pork and one of these is the firm's excess capacity. This is the amount of spare resources a firm has; for example for pig farmers it would be extra land for the pigs and extra shelter. If the producers have extra resources such as land the producer can increase the QS of free range pork more quickly and cheaply than if they had to negotiate and buy neighbours land. ==If a firm has excess capacity it means that they are producing below their maximum output therefore having room to increase the firm's capacity from point A to point B on the PPF model.== (I)
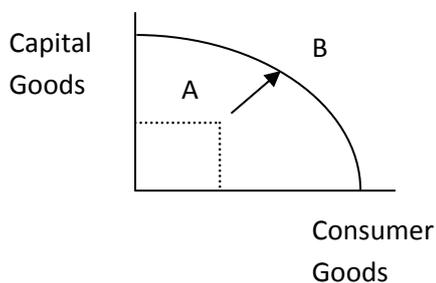
Another factor is if the pork can be stored then it is considered to be more elastic, because if the price of pork increases producers can increase supply more readily than if they only produce and supply fresh free range pork, and therefore gain more revenue. Lastly, the type of good or service affects elasticity of supply for free range pork. Depending on the type of pork it varies the type of elasticity. For example, imported pork is more elastic because New Zealand has no control over the type of conditions that the imported pork is produced in and they could produce their pork cheaper than NZ producers of free range pork who have to meet the requirements such as space and other standards. In NZ pork has to meet what is called the "100% New Zealand Pig Care Accredited Pork" which means that pigs are raised on NZ farms and produced according to the animal welfare standards and is free from added growth hormones. Therefore the type of pork production process affects the elasticity of supply for free range pork.

	Grade Boundary: High Achieved
4.	The student demonstrates understanding of micro-economic concepts, which is required for Achieved.
	The Achieved requirements have been covered and for Merit the standard also requires detailed explanations of micro-economic concepts supported by models and data.
	The student has calculated the co-efficient of price elasticity of demand, and presented this information related to the micro-economic concept of elasticity of demand. Refer to part J.
	The student has used models to illustrate the micro-economic concept of elasticity of supply. Refer to parts K.
	The student has explained the theory of elasticity of demand, but has not consistently linked it to the pork industry and has not used a model to support the explanations. Refer to part L.
	The student has explained the theory of elasticity of supply in more detail and used models to support the explanations, but in places has stated rather than explained a micro-economic concept (diminishing returns), and how it links to elasticity of supply. Refer to part M.
	To reach Merit level more detailed explanations are required. The student would need to fully address the weaknesses outlined above to demonstrate an in-depth understanding.

Elasticity of Demand

Free range pork (midpoint method)   Free range pork (percentage change method)
Ep= 700/1450 = 6.27   Ep= 700/1800x100 = 38% = 4.75%
     1/12.99   1/12.49x100   8%
NZ produced pork (midpoint method)   NZ produced pork (percentage change method)
Ep= 1050/2325 = 4.76   Ep= 1050/2850x100 = 36.8% = 3.68%
     1/10.49   1/9.99x100   10%

J

Elasticity of Demand is the proportionate responsiveness of the quantity demanded (QD) of a good to a change in its price. Free-range pork is a very elastic good because if the price increases then there would be a more than proportionate decrease in the QD as seen by the co-efficient being much greater than 1, using both methods of calculation. It is more elastic than NZ produced pork which had a co-efficient of 4.76 and 3.68%.

From a small survey I did, one person I interviewed said that if she could afford free-range pork she would buy it; therefore an increase in income could lead to more households buying free-range pork. However, this is not always the case as another person I interviewed said she could not afford free-range pork and even if the price decreased she would probably still buy imported pork as it is cheaper and she uses the money she saves to purchase something else that she needs. Free-range pork is also an elastic good because there are substitutes; the main reason is because free-range pork is a luxury item so the cheaper, inferior (a lower income good) goods become substitutes. The main alternatives are NZ produced pork, imported pork and chicken (other white meat option). These are all viable substitutes as they are cheaper than free-range pork. Free-range bacon is priced at $3.12 for 100g. The substitutes are NZ produced pork, which prices at $1.67 for 100g and imported bacon is $1.06 for 100g. Imported bacon is the cheapest substitute therefore more favourable to consumers; this is why it makes up 40% of total pork consumption and 700,000kg is sold weekly in NZ supermarkets', especially considering free-range bacon is over twice the price. If I did the Ey calculation, which is the change in QD divided by change in income, I would expect that free-range pork would be greater than 1, therefore making it a luxury item. And with the price of NZ produced pork set to increase, to cover the $266 per sow increase in costs I would expect that there should be an increase in the QD of imported pork due to it being the cheaper substitute.

L

Elasticity of Supply

Elasticity of supply is the responsiveness of the quantity supplied (QS) of a good or service to a change in price. The co-efficient is the % change in the QS divided by the % change in price. Calculating this co-efficient would show the elasticity of pork, by showing how a price increase influences the QS. According to the law of Supply as the price increases, the QS should also increase, ceteris paribus *(model included)*. The impact of sow stalls being banned increases the NZ producers costs of production, as the farmers using sow stalls now have to find an alternative place for the sows to live, thus a probable increase in the price to maintain profit margins. However this benefits free-range and imported pork as they become more price competitive with NZ pork producers.

Elasticity of supply is perfectly inelastic during the momentary period as there is only a very limited ability to increase the QS of NZ produced pork to the market as the available amount is already in the market place. Especially as fresh pork only has a shelf life of 2-5 days. There is only so much pork available at the moment, so no more output can be produced immediately. This graph shows that even if the price increases the QS remains constant.
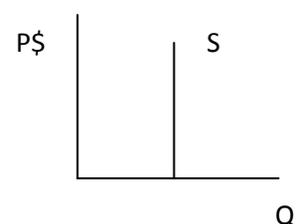
K

If the price of pork increases, producers are able to increase the QS to benefit from higher returns in the short run, they will want to increase the amount of pigs they are producing. But the fixed factor that limits them is the breeding cycle of a sow; their gestation period is 16 weeks after they have mated. Therefore the QS can't be increased a lot; otherwise the farmer experiences diminishing returns, as during the short run the farmer isn't able to maintain that quantity, so the farmer is only able to make a small response to QS to the market.

M

In the long run all resources involved in the production process are variable which means that over time all factors can be altered and improved to be more efficient and increase productivity. For example pig farmers are able to buy more land, build more sheds, employ more workers, breed more pigs or buy more pigs. Therefore a farmer is able to respond fully to a price increase. They can achieve economies of scale as they increase the scale of production, the average costs of production decrease as there is time to get good deals on purchases and are able to put more thought into the improvement of their business and so where money is best spent.
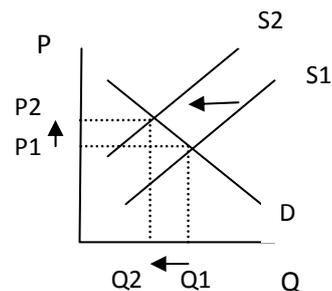
Price of NZ produced pork will increase by 4.5%, so that the producers are able to maintain their profit margins, this is shown in figure 1 as the graph for producers demonstrates that as the price increases the QS decreased to match the QD therefore the supply curve shifts to the left.

==Figure 1-NZ Produced Pork== (K)

Figure 1 shows the proportionate decrease from an increase in costs of production, which leads to an increase in the price. So the supply curve shifts left. As a result of this some producers may be forced to switch industries as they simply can't afford the change, but for those producers of the non-caged pork their revenue could potentially increase, as there is less brands available in that section of pork. For free-range producers their revenue could increase due to their pork being relatively more affordable from the price rise in NZ produced pork and due to consumer ethics from the actions of animal rights activists who are trying to raise awareness about the horrible conditions the caged pigs live in.

Imported producers will benefit from the increase in price of NZ produced pork as a lot of consumers simply can't afford to be ethical about the decisions they are making when it comes to food especially when free-range pork is a large proportion of their food allowance so the alternative is imported pork, which is why it makes up 40% of total pork consumption. Because free-range pork is the most elastic when price increases they will lose the most revenue as QD decreases. NZ produced pork is elastic, but the curve is not as flat as free-range pork so it will not lose as much revenue when price increases and QD decreases. Imported pork has the steepest curve and is the least elastic therefore the change in revenue is only little *(models were included)*. Frozen imported pork becomes more elastic as it is able to be stored; this makes it relatively easier to increase QS, whereas fresh pork from NZ isn't able to be stored as it has a shelf life of 2-5 days.

The supply of imported pork is more elastic as it is easier to produce because NZ doesn't have restrictions on the imports about how their pork is produced, so overseas producers are able to use crates, which increases production as less space is needed to produce the pigs.

	Grade Boundary: Low Achieved
5.	The student demonstrates understanding of micro-economic concepts, which is required for Achieved.

The student has calculated the co-efficient of price elasticity of demand from data collected from a survey, and presented secondary sources of information in explanations of the micro-economic concepts of elasticity of demand and supply. Refer to parts N.

The student has presented models to illustrate the micro-economic concepts of elasticity of demand and supply. Refer to parts O.

The student has stated rather than explained the theory of elasticity of supply and diminishing returns, and has not made reference to the graphs in the explanation. Refer to part P.

The student has explained the theory of elasticity of demand in relation to the pork industry using numerical information, a SAFE recording and an interview. Refer to highlighted parts in Q.

A more secure Achieved would be attained if there was more explanation of elasticity of supply and diminishing returns, rather than stated information from secondary sources, and reference made to the graphs in the explanation. |

Elasticity of Supply

Price elasticity of supply is the responsiveness of the QS of a good or service to a change in price. The coefficient of price elasticity of supply can be calculated by the following equation;

Es=%change in QS/%change in price. There are factors such as momentary period, short run and long run and others that affect the elasticity of supply.

Momentary (market period):

In the market period it is not possible to increase the QS because in the immediate period of time where the only available good is what's already on the market. In such a short period of time no more output is available to the market. In the market period if prices were to increase NZ produced pork would have perfectly inelastic supply as due to the short time period of right now, all output that is available is currently already in the market. So after doing the calculation we would expect to get a coefficient of 0. All factors/resources are fixed; it is not possible to produce more pork in market period because gestation time for pigs to have piglets is between 112-115 days according to the website, http://farmingfriends.com/breeding-pigs-gestation-period/
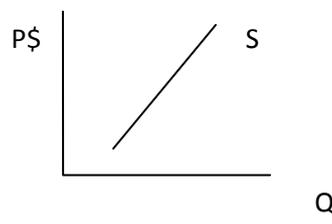
(N)

Graph A-Momentary Period
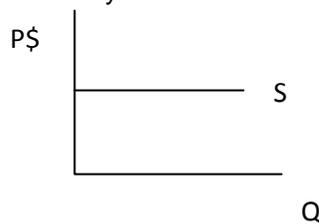Perfectly inelastic
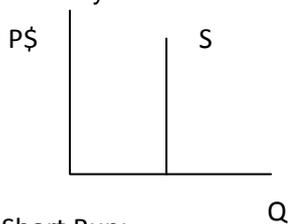
Graph B-Short Run
Inelastic

Graph C-Long Run
Perfectly elastic

(O)

Short Run:

In the short run, at least one resource is fixed, but it is possible to vary other resources. For example, NZ produced pork producers may only have one shed, therefore that is a fixed resource, but they may decide to employ more workers. Due to having one fixed factor/resource, this will eventually lead to diseconomies of scale meaning an increase in output leads to an increase in per unit cost. This results in the firm growing too large in the production process as more workers in one shed means they will run out of space, which will cause them to work inefficiently. This would cause diminishing returns, as more variable input (workers) combined with a fixed input (one shed) in the short run production; the marginal product of the variable input eventually begins to fall. This also means NZ produced pork will be slightly more elastic because they can adjust the supply slightly when prices rise.

Long Run:

In the long run all resources are variable. Therefore to increase supply of pork when price increases NZ producers, in the long run, may decide to buy more land and build more sheds so that it is possible for them to hold more pigs for producing pork as the price increases. Producers may experience economies of scale as they increase the scale of production and this leads to a fall in the average costs of production. NZ supply of produced pork would become more elastic. Therefore, after doing the calculation we would expect to have a coefficient greater than 1, moving closer to infinity or perfect elasticity.

(P)

Other factors that affect price elasticity of supply:

If a good is able to be stored then supply will be more elastic. Imported pork currently comes into NZ frozen (http://www.stuff.co.nz/business/opinion/4927062/pork-industry-pays-the-price) whereas NZ produced pork in fresh, so imported frozen pork is more elastic as the supply can be increased more readily if the price increases and NZ fresh produced pork can only be stored for 2-4 days.

(N)

If the producer has excess capacity then it would be relatively easier to increase the QS, if a NZ producer had an extra shed on their land that was not in use at the time (due to producing below maximum output), they may decide to purchase more pigs to increase their supply. Therefore, the supply would be slightly more elastic.

Certain pork is easier to produce than others, imported pork would be more elastic than free-range, because we have no control over the conditions of the pork that is imported and these producers are free to use sow crates, which increase productivity, whereas free-range pork has to meet health and welfare standards as well as the free-range regulations so it would be more inelastic.

Elasticity of Demand

Free-range bacon has elastic demand; this means when the price of a good changes there is a large response to this change and causes the QD to change by a more than proportionate percentage.

If we were to do the elasticity coefficient equation of: Ep=change in QD/[QD1+QD2/2]/[change in price/[P1+P2]/2 on the small sample group of supermarket shoppers seeing if price of free range bacon was to increase from $12.49 per 400g to $13.49, would they still purchase it. We then used these figures to calculate and got a coefficient of 6 (*student did calculation*); this shows that free-range bacon is very elastic and consumers had a large response to this price increase, as the price of pork increases there is a more than proportionate decrease in the QD, because it is an elastic good. The slope of the curve is more flat compared to an inelastic curve where the slope would be steeper.

Free-range pork has elastic demand because there are other substitutes for the job that free-range does such as NZ produced bacon, imported bacon or chicken. When gathering middle price bacon prices from Countdown, we see that Freedom Farms free-range bacon costs $12.49 per 400g, Ryan's bacon (imported) is $8.99 for 800g, NZ produced bacon is $9.99 for 600g and chicken costs $12.99 for 600g, showing there are other cheaper substitutes for free-range bacon.

P $ Elastic Demand

P1

P

D

Q1   Q   Q

Even though the production costs are to increase by 4.5% for NZ produced bacon due to trying to wipe out the factory farming of pigs (according to article, 'pork industry pays the price OVER THE FENCE' by Jon Morgan) this rises the price of NZ produced bacon to $10.44 for 600g, but is still cheaper than free-range bacon.
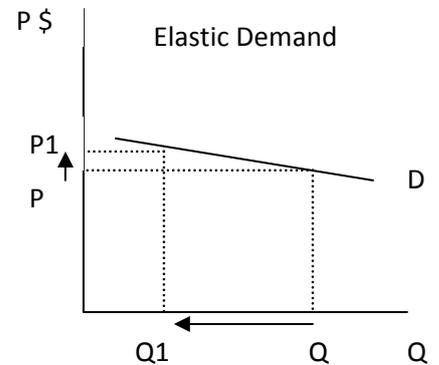
According to the DVD, 'Factory Farmed pigs in NZ, the price of pork' by SAFE, less than a 1/3 of NZ pig famers still use sow stalls. Sow stalls will eventually be banned and the use of farrowing crates will be restricted to just 4 weeks instead of 16 weeks, thus raising the cost of production $266 a sow and therefore increasing the price of NZ pork by 4.5%. If we calculated the cross elasticity of demand for NZ produced bacon, when the price went up to see if they would buy more substitutes we would likely see a positive coefficient as QD of imported bacon, chicken and possibly even free-range bacon would also increase.

Jon Morgan also states that the majority of shoppers are not prepared to pay more for free-range and the cheapest alternative is to buy imported pork which makes up 40% of our consumption. Free-range bacon is a luxury as it is expensive and not a necessity so therefore only those consumers who can afford it will purchase it. If we do the income elasticity co-efficient calculation for pork, the equation being % change in QD/% change in income we would expect to get a co-efficient of a value more than one, as free-range pork is a luxury good. Also feeding a whole family with free-range bacon for a meal becomes a larger percentage of a consumer's income. Imported bacon is less elastic than free-range bacon as it is a cheaper substitute for free-range bacon. If the income level of consumers increased we would expect the income elasticity co-efficient to be a positive number, as QD of luxury goods would increase. People in restaurants and baking businesses who use bacon may decide that free-range bacon is a necessity for their business. The owner of Fusion, Mr B explained that he only buys free-range pork and it is a normal good for him, rather than a luxury good because it is what his customers expect and is a better quality product to cook with.

	Grade Boundary: High Not Achieved
6.	The student has not adequately demonstrated an understanding of micro-economic concepts, which is required for Achieved. The student has calculated the co-efficient of price elasticity of demand from data collected from a survey. Refer to parts R. The student has presented models to illustrate the micro-economic concepts of elasticity of demand and supply. Refer to parts S. The student has made statements rather than explained the theory of elasticity of demand, and has not compared the different elasticities of demand, or linked the theory to the pork industry. Refer to part T. The student has explained the theory of elasticity of supply, but in places has stated rather than fully explained a micro-economic concept, like diminishing returns and supply. Refer to part U. To reach Achieved level the student would need to explain, rather than state, the theory of elasticity of demand, compare the different elasticities of demand and link them to the pork industry, and also explain the micro-economic concept of diminishing returns and supply.

Elasticity of Demand (T)

Price elasticity of demand is the responsiveness of QD of a good or service to its change in price, calculated by using mid-point method:

$$\frac{\frac{700}{(1800+1100)/2}}{\frac{1}{(12.49+13.49)/2}} = \frac{0.483}{0.0770} = 6.27$$

(R)

The calculation showed that free range pork had a coefficient greater than one, so is very elastic.

I consider free range pork (Freedom farms) to be an elastic demand (elastic demand is when the price of a good changes by a certain percentage and the QD changes by a greater percentage, QD is very responsive to price change). I think pork is elastic as it is a luxury good, not a necessity. Because of the availability of substitutes for free range pork it makes the demand for the free range pork more elastic as people switch to the substitutes, like NZ produced pork (Hellers) or imported (Ryan's pork). I am able to show this using the idea of cross elasticity of demand, for example if the price of NZ produced pork increased when the sow stalls are banned the demand for free range pork and/or imported pork would increase, therefore I would expect the coefficient to be positive. Cross elasticity of demand is the responsiveness of QD of a good to changes in the price of another good (usually a substitute or complement) this can be calculated by using the formula Exy= %change in QD of x/% change in price of y

If the price of pork increases there is a more than proportionate decrease in the QD, because it is an elastic good. The slope of the curve is more flat compared to an inelastic curve where the slope would be steeper.
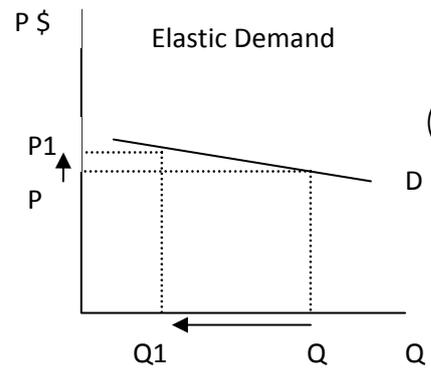
(S)

| Name of pork	Price per 400g
Free range (Freedom Farms)	$12.49
Imported (Ryan's)	$4.50
NZ produced (Hellers)	$6.66

(R)

Income elasticity of demand is defined as the responsiveness of QD of a good or service to changes in income. Therefore if a consumer has an increase in income then they would be more willing to buy pork because they have more disposable income. We use the following formula to calculate this Ey=%change in QD/%change in income.

Elasticity of Supply

Price elasticity of supply is the responsiveness to the QS of a good or service to a change in price. Momentary is the immediate period of time where the only amount available of a good is that which is already there. The market time period for pork supply is perfectly inelastic as in such a short amount of time no more output is available to the market. This can be shown by using the market (momentary time period graph, in which an increase in price causes no change in the QS, making it perfectly inelastic; coefficient is less than one).
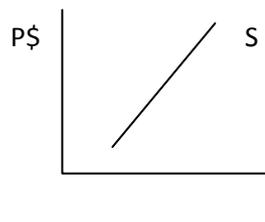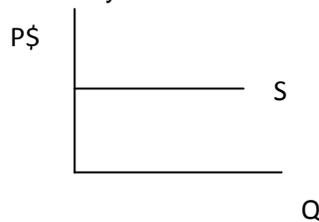
Momentary Period
Perfectly inelastic
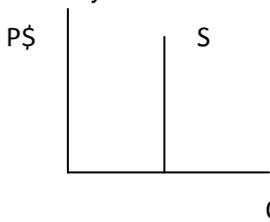
Short Run
Inelastic

Long Run
Perfectly elastic

(S)

In the short run at least one resource is fixed, but it I possible to vary all others. For example the amount of pigs they have is fixed but the number of workers is able to be increased or decreased. If the pork producer was to increase the number of employees they would be able to increase their supply by the slightest amount but not enough to make a significant difference; this would cause diminishing returns (output per unit is less) as they are not earning a

<mark>higher amount of profit for what they are putting into it. Because of the diminishing returns they would require a higher price for extra output produced. This links to elasticity of supply as the supply becomes more elastic (coefficient is greater than one) although there is still a fixed factor.</mark>

In the long run all resources are variable (all inputs into the production process can change) and firms can enter and leave the market, firms may also experience economies of scale (occur when a firm increases the scale of production and this leads to a fall in the average costs of production). The long run can cause firms to change industries, for example it would be better to be a free range pork producer than to use sow crates as with the new regulations coming in of sow crates being restricted the farmers that use them have to pay a higher cost to change, whereas the free range farmers do not use them, which means they will not lose profit because their costs of production are not increasing. The supply curve becomes more horizontal (perfectly elastic) in the long run, it is easier to increase output without requiring a higher price due to decreased average costs as a result of the economies of scale. This can be shown by using the graph of long run supply curve for a firm that is very elastic.

There are three other factors affecting price elasticity of supply. If the good is stored, the supply will become more elastic as it is relatively easy to increase QS of the good on the market if the price increased by using the stored supplies. For example, 700,000kgs of pork is imported into NZ each week, and as this is frozen means that we can store it for longer and is readily available so making it more elastic.

Another factor is if firms have excess capacity. If they are operating below maximum capacity it is relatively easy for them to increase QS making it more elastic. If NZ produced pork firms were not using all their resources to their full potential they would be able to do so resulting in an increase in supply, whereas it would be harder for a firm who is already producing at the maximum output to increase QS.

A final factor is the type of good or service it is, as certain goods or services will be easier to produce than others. For example the requirements for producing free range pork are much tougher making it more inelastic than imported pork which does not follow the same requirements; they are able to use sow crates and we have no control over how they produce the pork before it gets to NZ.