

Student 5: Low Achieved
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[The concept covered in this exemplar is elasticity of supply. The student also explained elasticity of demand, calculated and interpreted PED, XED and YED coefficients from the class survey, and applied the concept to the domestic demand for fresh cow's milk.]

### Elasticity of Supply

Price elasticity of supply (PES) measures responsiveness of quantity supplied (of a good or service) relative to the change in price. For this report, I will be discussing the PES relative to the increased price of milk products due to the dairy boom. One method used to work out the PES of a good is the percentage change method. It is calculated by; (percentage change in quantity supplied / percentage change in price). If the coefficient is less than one ( $PES < 1$ ) then the good is inelastic. If the coefficient is greater than one ( $PES > 1$ ) then the good is elastic. In the report, I will explain the theory of PES to conclude whether cow's milk is elastic or inelastic. From the calculation, we get an idea of what extent high prices for milk will lead to changes in QS thus providing a value for PES so we can conclude if the supply of milk is inelastic or elastic. We can also look at other factors that enable us to decide whether the supply of cow's milk is elastic or inelastic. (Market/Momentary Period was also explained).

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Goods are relatively inelastic in the short run period. During the short run period, at least one input/resource is fixed. So even when price increases, the producer's ability to increase QS can be limited because they are restricted by the amount of inputs/resources that they can increase, which are variable inputs. Therefore, this means that an increase in QS will be proportionally less than the change in price, and  $PES < 1$ . In the case of cow's milk, a short run fixed input/resource may include, land space, the number of dairy cows, milking sheds and processing sites, and the current level of technology. In the case of the fixed input, cow's milk production in the short run could be limited by the number of dairy cows that farmers/producers own. With a fixed number of dairy cows, it means that producers/farmers cannot increase their quantity supplied beyond capacity to meet the increased demand in the short run. However, a producer enticed by the higher price for milk products and wanting to increase the amount of milk they supply to the market is limited to increasing such things as working more hours to maximise production with their current level of fixed inputs, such as the level of cowherd or number of milking machines. This is unlikely to produce very much more milk and because milk is a non-durable good, it is easily and quickly perishable within a week or two. Producers cannot stock up on fresh milk by a large quantity as it will go off, which makes the supply of fresh milk inelastic. This will mean that a change in price will cause a less than proportionate change in quantity supplied because the producer is unlikely to have a stockpile of the product to be released when the market price is favourably high. Whereas, milk powder a related good lasts longer so is a more durable good. Milk powder can be stored and has a reasonable shelf life which means producers of milk powder are better able to respond to price changes and more easily increase their quantity supplied which makes milk powder more elastic in terms of PES (as the response to a change in price is larger). A producer like Fonterra could stock up milk powder, and could release more of their stock when the price increases which makes it more elastic than fresh milk, which is a non-durable good.

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In the long run, the PES of goods will be elastic. This is because all resources/inputs are variable in the long-run period. This means that when prices increases, producers have a

greater ability to increase the QS compared to when all or at least one input was fixed, as there are no inputs/resources restricting their ability to increase QS. This will mean that QS is able to increase proportionally more than the increase in price, and  $PES > 1$ . Over time, supply will be more elastic as producers are able to increase their production level and therefore QS. Firms have a better ability to adapt and produce goods more efficiently and readily in the long run. Existing producers are able to increase the production levels by increasing investment, to expand and buy more land so they can feed a larger herd of cows and build another milking shed, which would assist them in increasing their total output levels and therefore increase QS.

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New producers will enter the dairy market resulting in further increases in total output levels. An increase in profitability in the dairy industry would lead to other farmers e.g. sheep farmers, converting to dairy farming. In the long run, with new producers in the market increasing output levels further, this will increase the total market supply.

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A production possibility curve (PPC) is a curve that shows the maximum combinations of two

outputs that can be produced with a given level of resources and technology.

According to the theory, point A inside the PPC curve indicates that there are some resources not being used to full capacity. Because there is spare capacity, it would mean that there is the ability to increase QS. Compared with no spare capacity and all resources being

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used to full capacity (point B), which means increasing QS happens in the long run period.

**For example** - If dairy farmers had spare capacity like land they were not using, they could purchase more dairy cows to make full use of this space, which may lead to an increase in the output levels of cow's milk. Therefore, with an increased level of output (cow's milk) produced, the greater the ability the farmers/producers have in increasing QS in response to an increase in price. Additionally, dairy farmers may have spare capacity because they could use the current workers, equipment and technology more efficiently or they could invest and get old equipment upgraded. Because these farmers have spare capacity it means they could increase output levels for cow's milk and increase QS in the short run period.

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#### Relevant parts of presented economic information

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"Fonterra controls nearly 90 per cent of the country's raw milk supply."

<http://www.stuff.co.nz/business/farming/7949379/Govt-tightens-Fonterra-raw-milk-rules>

#### FONTERRA 2014 ANNUAL RESULT (published 24 September 2014)

"Milk collection across New Zealand reached 1,584 million kg MS [milk solids], 8% higher than last season. However, record milk volumes did not fully translate into increased sales volume, as the year began with low inventory levels as a result of the previous season's drought. Total sales volume was up 1% and revenue increased 30% from \$13.9 billion to \$18 billion."

<http://www.fonterra.com/global/en/hub/sites/news+and+media/media+releases/fonterra+2014+annual+result/fonterra+2014+annual+result>

#### Food Price Index (fpi-dec14-tables.xls)

Percentage change from same month of previous year

Fresh Milk: Aug. 10.6% Sept. 3.2% Oct. 6.2% Nov. 7.6% Dec. 3.0%

[http://www.stats.govt.nz/browse\\_for\\_stats/economic\\_indicators/prices\\_indexes/food-price-index-info-releases.aspx](http://www.stats.govt.nz/browse_for_stats/economic_indicators/prices_indexes/food-price-index-info-releases.aspx)