

93105A



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TOP SCHOLAR EXEMPLAR



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

Scholarship 2016 Agricultural and Horticultural Science

9.30 a.m. Wednesday 23 November 2016

Time allowed: Three hours

Total marks: 24

ANSWER BOOKLET

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

Answer ALL questions from Question Booklet 93105Q.

Write your answers in this booklet.

Start your planning and answers to Questions One, Two, and Three from pages 2, 8, and 14 respectively.

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–24 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

QUESTION ONE: CONTEMPORARY ISSUES (8 marks)

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PLANNING

Use this space to plan your answer to Question One:

food safety

IMPACT

- profit loss & recalls
- ~~negative~~ negative media attention.
-
- + very strict food safety regulations
- + opp. to fiscal flaws in system

CONSUMERS

- safety #1
- boycott in China

RESPONSE

- reorganization (Zepri recall checks
Fonterra new Group Food Safety dir.
within days reporting)
- own up (Fonterra govt. req.)
- calm and reasonable response to media

1. organs consider it preventable
2. very strict food safety requirements (proposed, impact)
3. impacts of crises, consumer reaction
4. response to crises

Begin your answer to Question One here:

Consumers worldwide consider food safety ~~as~~ a prominent factor in their shopping decisions. This has naturally had an impact on NZ's production systems, which have responded by implementing strict food safety controls, at their stage of the supply chain and also before and after; however, it could be argued that consumers have even higher standards, for food safety concerns — real or imagined — have continued to periodically impact NZ's production systems, like kiwifruit and dairy, with lesser, harsher, negative media attention and, on the positive side, caused them to take up even more stringent checks, protocols and standards. Possibly the factor of food safety is a cycle wherein consumers' shopping standards climb ever higher and production systems continue reshuffling and improving upon checks in order to meet their demands; one would hope that the outcome is safe food for all.

Studies have shown that consumers globally consider food safety the single most important factor in their buying decisions, and rightfully so; food safety outranks traditional economic determinants like price, availability and packaging. The impact this has had on NZ production systems is a determined response to rise in global consumers' standards, as well as appeal to their demonstrated ~~taste~~ taste for security. Companies like Zespri and Fonterra market themselves as world-class in safety, leveraging NZ's "clean green" reputation: Zespri, for example, considers its "Zespri Z system", including its safety, compliance and control systems, as "a foundation block to the Zespri brand," and Fonterra too says that its "reputation for quality ~~and safety~~" is a major competitive advantage. They have ~~also~~ also, of course, put in place stringent food ~~safety~~ safety checks to ensure they live up to their reputations: Zespri, for example, not only controls its own produce but monitors processors later down the supply chain to ensure its product

is handled responsibly.

However, one could argue that those measures have been insufficient for consumers worldwide and especially the media, which one might ~~be~~ almost be inclined to suspect of ^{in recent years} perpetuating tall-poppy syndrome, for food safety has very ~~so often~~ surfaced again to cause headaches for the relevant industries. The impacts these "crises" have had on production systems are predictable: every time, they cause profit losses, hassle in recalls ~~and~~ and sometimes court of law, and much negative ~~press~~. Fortunately, they usually also have the impact of making companies tighten food safety efforts even further, which hopefully staves off at least some future crises.)

Zespri and Fonterra have both recently felt the impacts of food safety in the form of crises, ~~as~~ although both were false alarms (though in Fonterra's case a legitimate one). For Zespri, the "crisis" was a fungus found in Chinese containers of kiwifruit exports; even ~~though~~ though the fungus ~~was~~ was not a food safety concern, it was labelled somewhat misguidedly a "pathogen" by Chinese inspectors, and it subsequently ~~made~~ made the rounds in Chinese media (I am personally ~~too~~ tooify) as a food safety scare. While the ~~rumor~~ was quickly rebutted, it still garnered Zespri considerable negative media attention. Fonterra, meanwhile, was forced to recall more than 1,000 tons of product in 2013 due to ~~a~~ the discovery of a potentially botulism-causing bacterium; while it ultimately proved to be a false alarm, the crisis had significant negative impacts on Fonterra, as it lost 1,000 tons of product, was fined \$300,000 in NZ court after pleading guilty to four charges, and was also sued by French company Danone (which owned the brand of milk product in which the bacterium was discovered) for €300m.

in damages. Fonterra, like Zespri, experienced considerable negative press during this time, and many countries — Sri Lanka, and some European countries as well as China — placed temporary restrictions against NZ products, hampering the NZ dairy industry overall. Both cases show that food safety “crises” can have considerable negative impacts on NZ production systems.

Fortunately, the responses of NZ companies ~~are~~ generally admirable, which mean that food safety crises often also result in positive impacts, namely reorganization and the implementation of further preventative measures. In response to consumers who are highly sensitive to the issue of food safety, action has usually ~~is~~ been swift and decisive: after the Listeria problem, Zespri immediately imposed new checks on its product to ~~prevent~~ prevent the same problem in future. Fonterra's response was even more swift and extensive, in proportion to the scale of its problem: by the year's end, it had ~~first~~ created ^{the} new post of Group Food Safety director, reporting directly to the CEO, and—as the CEO testifies—"within days" of the event an ~~an~~ investigation was being carried out as to why the problem occurred and how it could be precluded in future, with implementation of the report's results already ~~underway~~ underway by the end of that financial year. ~~that~~ ~~that~~ ~~that~~ ~~that~~ ~~that~~ In response to consumer concerns, both companies' policy has generally been to be open^{and} honest, ~~and~~ as Fonterra demonstrated when it agreed with the Chinese temporary embargo on NZ milk, calling it "entirely reasonable". This willing and change-focused response to ~~the~~ food safety is ~~a~~ reassuring, and even though food safety has clearly had negative impacts on the relevant industries, thanks to their honest policies ~~it~~ ~~it~~ it has also had positive impacts, driven by companies' responsible responses.

In sum, the food safety issue is critically important to consumers worldwide, and NZ production systems have responded accordingly, making food safety a priority and being willing to adjust when crises do occur. Although food safety has had many negative impacts on both dairy and horticultural industries in recent years, these ~~negative~~ responses and likely will continue to do so as consumers' standards ~~grow~~ are ^{if} higher, these industries' positive ~~responses~~ responses have allowed ~~to~~ ^{which} also to have positive impacts ~~and~~ hopefully result in safer food for all consumers.

QUESTION TWO: PRICE VOLATILITY AND PRIMARY PRODUCTION SYSTEMS (8 marks)

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PLANNING

Use this space to plan your answer to Question Two:

CAUSES

- trade barriers
- Supply-side inelasticity, inelasticity of demand
- recent events - exclamation

IMPACT ON SUSTAINABILITY

- env. - farms less willing to comply w/ environmental regulations
+ some realize that env. → greater efficiency
- eco. - difficult to manage cashflow, losses of profits
+ more efficiency

RESPONSE / FUTURE RESPONSE

- pain felt around the world; push for lowered trade barriers
- Taitera offers lock-in prices
- tightened belts and more caution exercised

Begin your answer to Question Two here:

Dairy is a ~~very~~ price-volatile market by nature, due to inelasticity of both demand and supply in commodity goods; however, the impact of trade barriers by other nations and recent global events have exacerbated that volatility. This volatility ~~is~~ has ~~had~~ impacts both positive and negative, on the environmental and economic sustainability of the NZ dairy industry. So far, the ~~the~~ industry's response to recent volatility has been both predictable and sensible; a potential future response might be to use this time to push for lowered ^{dairy} ~~global~~ trade barriers ~~at the world~~, as the pain has been felt by farmers around the world.

^{markets}
Commodity goods[^] are ~~are~~ unavoidably prone to price volatility, because their status as a necessity, ~~is~~ and therefore lack of alternatives, results in very low price elasticity of demand, and the fact that most commodity production relies on agriculture, which can only adjust its supply once a year, also leads to supply-side inelasticity. However, this innate trait has recently been exacerbated ~~in the dairy industry~~ ~~in~~ both by trade barriers and recent events. Dairy is one of the most protected industries on Earth: for example, Japan's ~~high~~ tariffs on butter are at 400%, and less than 2% of its dairy market is open to the international market. The US and Canada have similarly prohibitive measures in place to protect their dairy industries. As a result, the dairy market is a "thin market", which for simple statistical reasons is prone to price volatility; tariffs also act as a pro-cyclic agent, as they tend to decrease when demand is high (thus opening the market and increasing demand further) and vice versa when it is high. Therefore, the protected state of the dairy industry is often cited as a cause of price volatility. Current affairs have also resulted in a price slump recently after the high of 2013/14: Europe ^{recently} relaxed a milk production quota, resulting in increased supply;

Russia imposed import bans on Australian, US and other nations' milk, resulting in product being displaced on the world market and so falling prices; China's economy has slowed and it is using its stockpiles of product to lessen its dependency on milk imports.

~~These factors have contributed to additional volatility in an industry that is already volatile by nature.~~

Price volatility has several impacts on sustainability, both negative and positive. From an environmental perspective, farmers are less likely to prioritize environmental consent compliance when they are in debt due to volatility in the markets, and as such effluent pollution and greenhouse gas emissions, commonly cited as environmental problems in the dairy industry, may increase. A report issued by Environment Waikato, for example, cited farmers' "having plans but not the money" as one of the key reasons for non-compliance with environmental regulations. However, those farmers that have ^{sustainable} capital to spare may realize that implementing environmentally ^{sustainable} practices, while costly in the short run, may actually help them to be more efficient in the face of continued price volatility: as Teaterra emphatically highlights in their sustainability publications, environmental sustainability ~~is often~~ ^{is} correlated with operational efficiency. Hence price volatility also has the potential to make a positive impact on the ^{environmental} sustainability of the dairy industry.

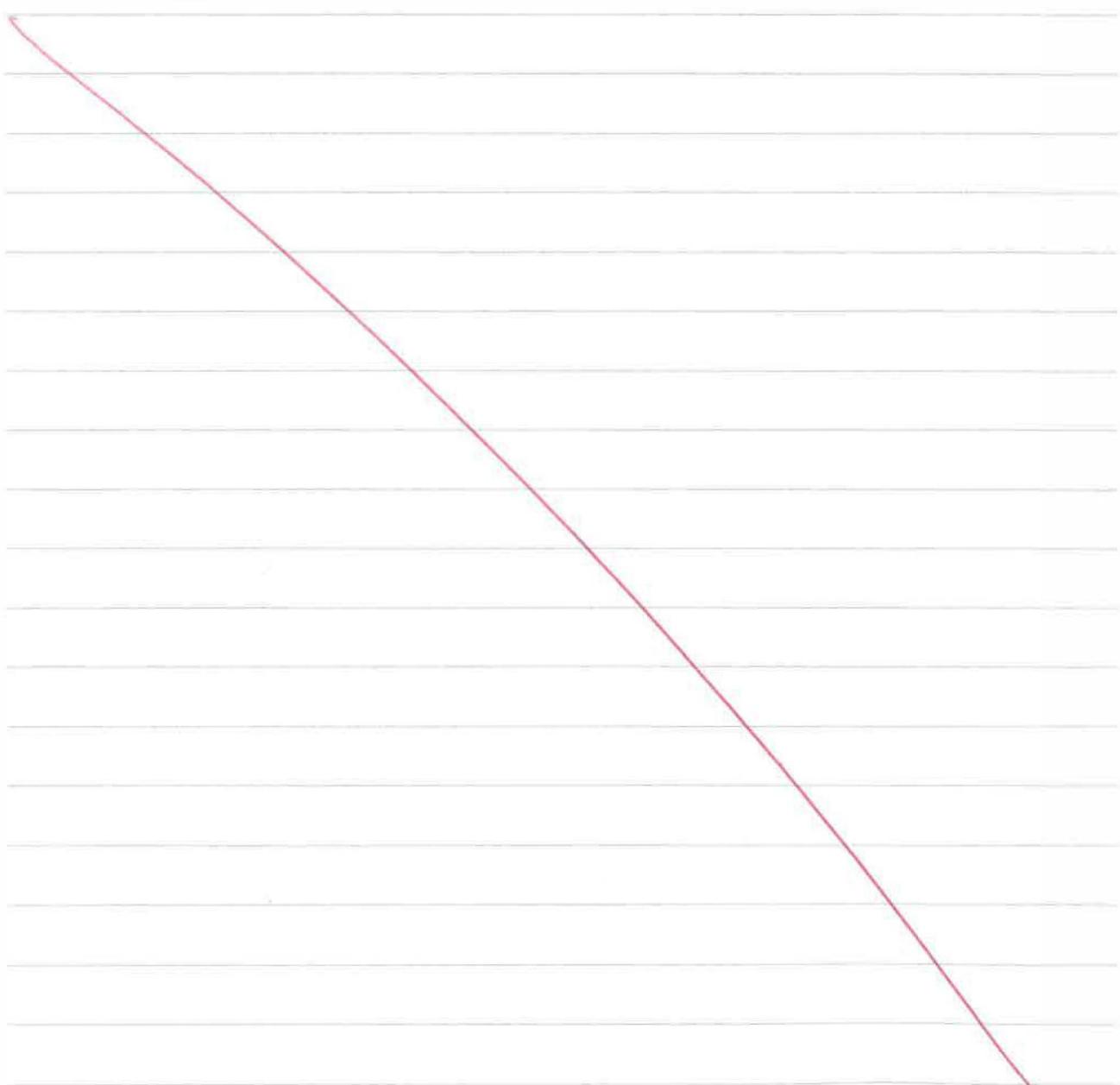
The situation from an economic^{and social} sustainability perspective is similar; price volatility has been notorious for its negative economic impacts, drawing about \$7b from the NZ economy in 2014, but it has also in many cases led to increased efficiency. Price volatility makes it very difficult for farmers to manage capital, because they cannot predict safely what their profits will be in the

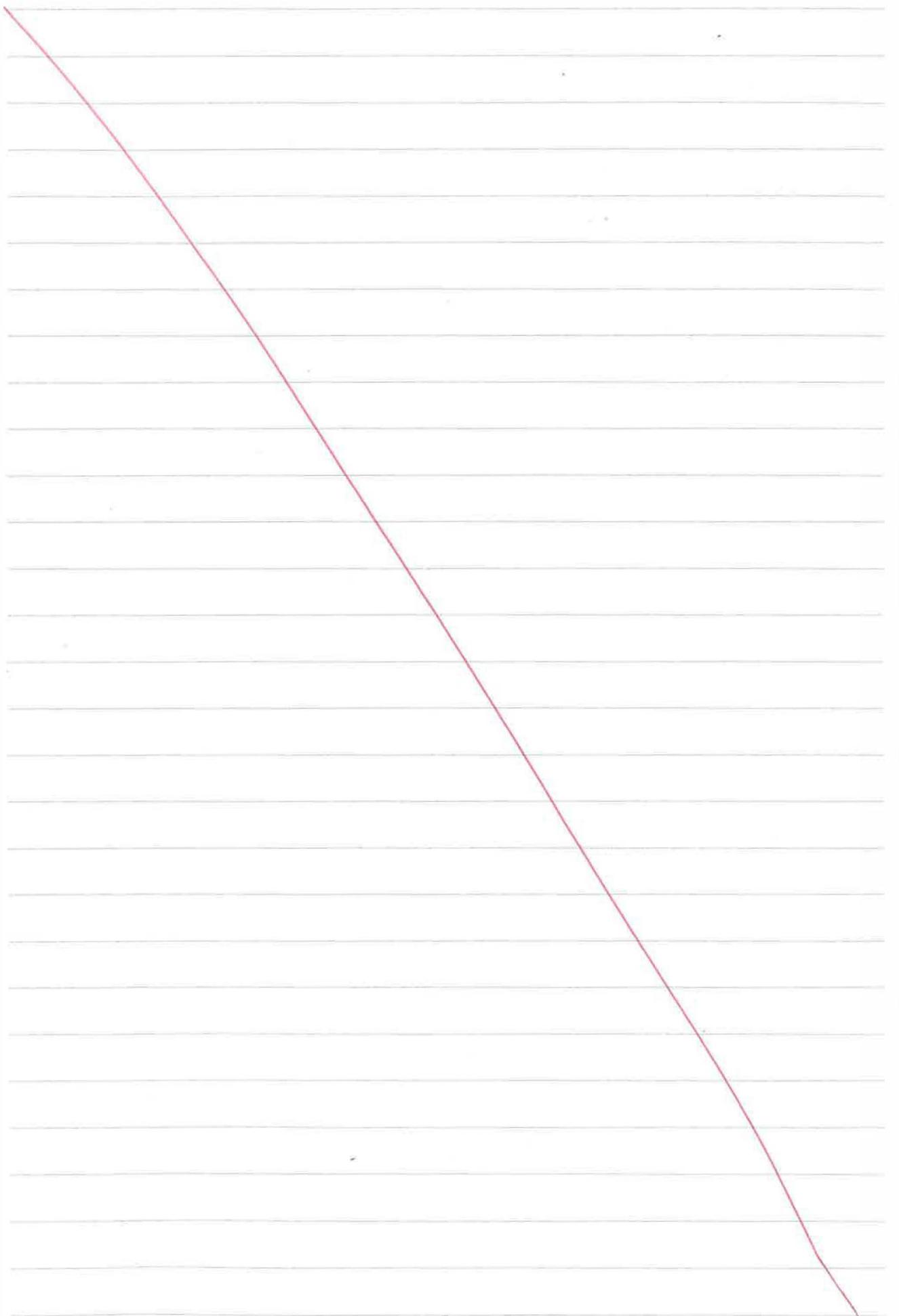
year dairy and accordingly average debt and new investments. High fixed asset costs, left over from the last era of high prices — for example the 2013/14 dairy boom → drove land prices in dairy regions up by about 14% — can make it difficult for farmers to manage their debts. However, as ANZ's commercial and agriculture manager director Hiddleston testifies, many farmers who took on debt during the first year of low dairy prices have made radical efficiency improvements to their farm during the second year so that they no longer need more debt, exemplifying how one can increase economic sustainability in a crisis. As the farmers tell ANZ: "We can have better businesses." Hence, like the environmental perspective, price volatility can have both negative and positive impacts on economic (and by extension social) sustainability. 1

So far responses to the agency volatility have been ~~so different as~~^{comparable if predictable:} ~~either~~^{either} detailed in the previous paragraph, farmers have increased their efficiency or taken on more debt, and have learned to exercise caution in times of high prices, left the bubble burst, for "you can't control the situation in Europe, but you can control the farm" (Hiddleston). Fonterra has also, for the past several years, offered to buy produce from farmers at locked-in prices, and while the hedge bet was under-subscribed last year, many farmers have taken up the option. This damage control has been by and large effective, or that although the dairy industry is still suffering (and the NZ economy too, as a result) the crisis is not as severe this year as it was last year. Current trends suggest that Fonterra could leverage the new need for efficiency to further promote its environmental sustainability initiatives — which it seems already to be doing in part, while still offering support for those farmers too heavily in debt to make changes, or compro-

dairy line — and also that the NZ government may be able ~~to~~ use ~~the~~ this volatility, the pain it which has been felt not only in NZ but in unsubsidized dairy farms around the world, ^{and strike trade deals} including in China, to push for more open trade in the dairy industry, which would likely be very advantageous for NZ's export-oriented dairy industry.

Price volatility is an ongoing issue in dairy; it ~~can~~ impacts the sustainability, both environmental and economic, ~~as~~ in mostly negative but also several positive ways, which have triggered a variety of responses //





QUESTION THREE: GLOBAL FOOD TRENDS (8 marks)

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PLANNING

Use this space to plan your answer to Question Three:

THREATS

- evidence that the environment is degrading
 - ↳ 60% ~~sustainable~~ unsafe to swim in water
Canterbury rivers → production: emphasize ~~sustainable~~ sustainability
- "fresh" → local → cool → trade barriers → ↳ more price volatility
 - ↑
more emphasis
or
- food safety scares (Zephi)
 - production: be more careful and stringent

OPPORTUNITIES

- + tends to appeal to the same market
- + "clean green" ~~image~~ image, even though most export produce in NZ is commercial
size / hundred
- + capitalize on; market in a way that promotes the image
- biodiversity
- + production: introduce organic lines
 - ~~biopesticides, organic especially many fruits~~

Begin your answer to Question Three here:

New Zealand's "clean green" environment has almost become a cliché, and because it tends to appeal to the same audience that is driving the "natural, fresh, organic" movement, this trend presents ~~a~~ vital opportunity for New Zealand's primary producers, like dairy ~~the~~ and kiwifruit exporters, to effectively target its market(s). It could also make the introduction of organic lines a possible opportunity in production, as most of NZ's exports ^{volume(s)} ~~from the farm~~ "conventional" produce. However, multiple threats ^{thu} also arise which producers should be aware of; among them, are evidence that NZ's environment may be degrading, ~~which would damage the "clean green"~~ the corollary rise of "locally grown" produce as a response to the "natural & fresh" movement, and the added need to exercise caution over food safety, lest future scares impact the industry even more severely than they normally do.

The Ministry for the Environment estimated in a report that NZ's "clean green" image ~~is~~ accounted for as much as 54% of its ^{produce} sales overseas and was potentially worth "hundreds of millions or even billions of dollars". Those same consumers driving the "natural, fresh, organic" ~~to~~ movement—environmentally conscientious, health-aware consumers—are naturally also drawn to NZ's "clean green" brand, even though most of NZ's exports are of ~~conventionally-grown~~ produce. This represents a vital opportunity for NZ's primary producers, who ~~should~~ can capitalize on the growing global emphasis on "naturalness" to leverage NZ's brand as a marketing tool. This brand is by now well-established in global markets, having ~~been~~ been introduced decades ago, and therefore represents a valuable asset to NZ marketing departments. Indeed, ~~parties~~ companies like Zespri and Fonterra have long already recognized this opportunity and have redoubled efforts to appear eco-friendly and sustainable: Zespri, for example, has in recent years introduced "natural" bee pollination and other such efforts.

to promote biodiversity, and Fonterra has cooperated with the Dept. of Conservation on the "Biodiversity Advantage" campaign, whose name clearly recognizes the advantage that NZ's image of biodiversity and "naturalness" affords it overseas, as well as the need to protect it. //

Another potential opportunity that arises from this trend is the growing market for organic products, which still remains to be filled in an ^{export sector} NZ ~~sector~~ dominated by mostly-conventional-produce, represented in industry giants like Zespri and Fonterra. These industry giants may very soon introduce new organic lines to exploit the growing organic ~~market~~ niche on the global market, but this niche also represents an opportunity for smaller companies to gain ground in what would otherwise be largely oligopolistic or monopolistic industries. This ~~expanding~~ ^{profitably} global trend represents an opportunity for large and small NZ-based companies alike to alter their production lines and possibly introduce new organic products in order to exploit a fast-growing market niche. //

^{and produces}
 However, companies' should also be aware of burgeoning threats ~~that~~ ^{other} that arise as a result of a combination of this global trend and recent global or NZ trends. One is the very real danger that NZ will sometime in the future lose its "clean green" image, which if lost, in an increasingly environmentally- and health-conscious world market, would be almost impossible to rebuild. Recent reports show that ^{20% of} ~~heavy dairy regions,~~ NZ's waterways are now unsafe to swim in, with the worst affected, Canterbury ~~area~~ alone has a record 9 waterways graded as "very poor" in quality. The global "natural & fresh" trend makes it ~~is~~ even more imperative that NZ producers take action to promote sustainability so that the "clean green" image, a vital competitive advantage, is protected. As the Environment Ministry's 2006 re-

past indicated, NZ could lose as much as 54% of its overseas sales in produce if its environment were to degrade. Because the NZ economy is so tightly coupled with the fate of its primary export industries, this is a very severe and serious threat.

~~The growing preference for "fresh" food is also driving an increasing consumer tendency to purchase products that are locally grown, which is problematic for an export-oriented economy like NZ's. The recent rise of country-of-origin labeling regulations, driven largely by the COOL (COOL) (Country of Origin Labeling) regulations, across the world has exacerbated this trend, and producers should be aware of this threat. In Italy, for example, a report showed that half of Italian consumers were willing to pay as much as 20% more for "locally grown" or "Italian grown" produce; Italy has recently introduced mandatory COOL, and France has also followed suit with a pilot program. The NZ government have argued that COOL essentially constitutes a trade barrier, a view ratified when the WTO ruled in 2015 that the US's COOL regulations were a discriminatory trade barrier and authorized Canada and Mexico to raise retaliatory tariffs totaling to ~\$1.1 bn. This trend closes many overseas markets to NZ producers, and the resultant trade barriers produce a thin market that is prone to price volatility, threats which NZ producers ought to be aware of.~~

Finally, NZ producers should be aware of the ever-increasing media sensitivity to food safety concerns that comes as a result of a progressively more health-conscious global consumer population. Zespri learned this lesson dearly when a fungus was discovered in some Chinese shipment containers containing Zespri Kiwifruit; even though the fungus did not pose food safety concerns, the Chinese biosecurity

control called it by the somewhat misleading name of "pathogen" and the fungus ~~insects~~ immediately made the news rounds as a food safety scare, especially in China, ~~where~~ which is a critical market for NZ producers. There were also rumours at the time that Beijing intended to start a trade war, and Zespri's mistake constituted an easy excuse: surveys globally have revealed that safety is consumers' #1 food concern, rightfully so, but as many producers, including NZ's, have tried to market ~~them~~ themselves as fresh and natural, the media has become even more hypersensitive to food safety scares. NZ producers should therefore be aware that, in a ~~real~~ world increasingly concerned about safety and health and "freshness", they must be doubly cautious about food safety to ~~protect your brand if = "this"~~

Second (a)

The trend in "natural, fresh and organic" produce presents opportunities but also threats to NZ producers, and a cautious awareness of the adaptations that can be made to production and marketing in order to leverage the former and avoid the latter may benefit producer in years to come. Opportunities include the potential reward leveraged power of NZ's "clean green" image and a growing niche for organic produce; threats include the potential degradation of the NZ environment, ~~the~~ increasingly closed national markets worldwide, and media hypersensitivity to food safety concerns, ~~a~~ recall or ~~is~~ imagined. This trend will as such likely in part shape the decisions made by NZ producer for the ~~next~~ ~~two~~ ~~three~~ years to come.

