

# **OUTSTANDING TEACHING, LEARNING AND ASSESSMENT TECHNICAL SKILLS NATIONAL PROGRAMME**

**Lean Teaching Toolkit  
Created by: Reaseheath College**

Managed by



In partnership with

**emfec**



# **BUILDING LESSON PLANS AROUND SUPPLIERS-INPUTS-PROCESS- OUTPUTS-CUSTOMERS (SIPOC'S)**

## **USING THE LEAN TOOLKIT TO FRAME THE NEW CURRICULUM**



## SIPOC'S

### Objective:

- Rewrite curriculum to integrate LEAN tools into lesson plans to encourage students to understand the interrelated nature of the supply chain
- to encourage independent student led learning through the use of Industry developed SIGMA 6 LEAN tool for them to complete their assessed business module

### Example of new lesson plan – Level 3 Agriculture 306 Business

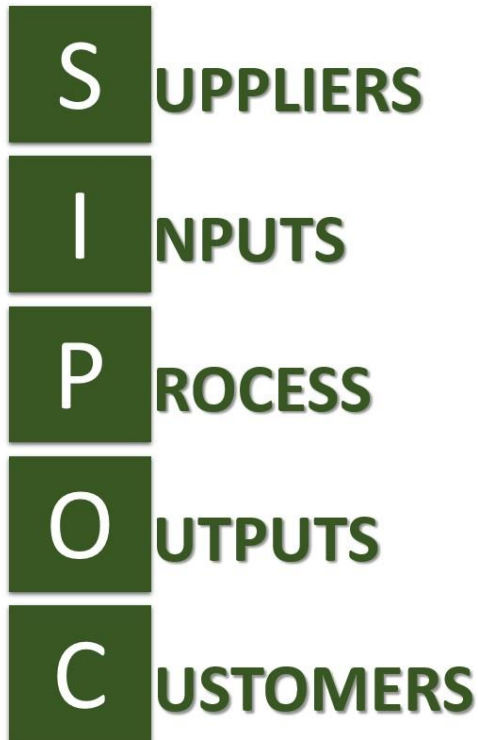
Lesson Planner
<b>Course:</b> Level 3 Agriculture 306 Business <b>SoW Ref:</b> 06 <b>Lesson Aim:</b> Use LEAN tools (SIPOC) to allow students to describe the inter related nature of supply chains

What are the learning outcomes?
<ol style="list-style-type: none"> <li>1. Evaluate the use of SIPOC's in describing the interrelated nature of supply chains</li> <li>2. Identify the aims and roles of four organisations which influence Agriculture in the UK</li> </ol>

Which activities will lead to learning?	Timings	How will learning be assessed?
Register, check badges and confirm the learning outcomes	5 mins	Use everyday example of preparing a pizza to show learners how a SIPOC is constructed
Introduction to LEAN & the SIPOC tool.	5 mins	
<b>Task A:</b> Learners to construct a SIPOC poster for a select business (Dairy, Sheep, Arable or Beef farm) that includes Suppliers, Inputs, Processes, Outputs and Customers.	25 mins	Learners will split into 4 groups and construct a SIPOC poster for a separate industry (Dairy, Sheep, Arable or Beef farm).  Feedback from learners on how changing one process or product will impact on other areas of the supply chain
<b>Task B:</b> Focussing on Suppliers from the SIPOC, learners will identify what the following suppliers would provide as 'Inputs@ to their SIPOC: <ul style="list-style-type: none"> <li>• AFS (red Tractor)</li> <li>• AHDB</li> <li>• DEFRA</li> <li>• NFU</li> </ul>	20 mins	Learners will investigate roles of the 4 'Suppliers' and discuss further as a group their findings. Students to add additional detail to their SIPOCs
Summarise what has been achieved in the session, assign homework task	5 mins	Ask Direct questions to groups to check their learning



## Example of a SIPOC



Seed Companies, Feed Suppliers, Agronomists, Banks, Machinery Dealerships, Banks, Advisors, Consultants, Legal Suppliers, Governing Bodies Contractors ...

Breeding Ewes, Rams, Animal Feed, Medicines, Wormers, Finance, Buildings, Handling Facilities, labour, Utilities, Machinery, Veterinary, Transport, Stock Tools, Data tools, Straw, Grass, Labour ...

**Primary:** Ration Formulation, Feeding, Health management, Lambing, Weaning, Flock Health Care, Breed Management, Movements, Data Management, Shearing, Dagging, Ram MOT...

**Secondary:** Slaughter, Manufacturing, Extraction, Purification...

**Primary:** Meat Carcass, Wool, Waste (Fertiliser)...

**Secondary:** Leather (Skins), Tallow, Industrial Waste (Bones, fat, etc.)...

Euro Quality Lambs Ltd, John Pointon & Sons Ltd (Renderers), British Wool Marketing Board, Aston Martin, [Symply](#) Pet Foods Ltd, Johnson & Johnson (Tallow)...



## Example 1 of SIPOC completed by student

### Dairy industry SIPOC

Suppliers	Inputs	Processes	Outputs	Customers
<p><b>Spunhill</b> (sprays, seed, minerals, general farm supplies like paper towels)</p> <p><b>For Farmers</b> (Feed, minerals and diet plans)</p> <p><b>Wynnstay</b> (milk powder and wormers)</p> <p><b>Emyr Evans</b> (machinery)</p> <p><b>Stanford Agricultural Services</b> (feeding equipment maintenance)</p> <p><b>Scottish power</b></p> <p><b>Welsh water</b></p> <p><b>Cooke brothers</b> (milking plant and general farm supplies)</p> <p><b>Willow vets</b> (all aspects of stock from scanning to hoof trimming)</p> <p><b>Governing bodies</b> (farm assurance)</p> <p><b>Advisors</b> (kite consultants)</p> <p><b>Wright Marshall</b></p>	<p>Labour</p> <p>Feed</p> <p>Electric</p> <p>Building/ maintenance</p> <p>Rent/mortgage</p> <p>Machinery purchasing/hiring</p> <p>General capital</p> <p>Fertilisers</p> <p>Vet costs</p> <p>Milking equipment</p> <p>Diet plans</p> <p>Handling facilities</p> <p>Stock tools</p> <p>Data tools (DP menu)</p> <p>Medicines</p> <p>Contractors</p> <p>Transport</p> <p>Straw/grass</p>	<p><b>Primary</b></p> <p>Feeding/feed planning</p> <p>Milking</p> <p>Scraping out (sanitising)</p> <p>Bedding</p> <p>Calving</p> <p>Foot trimming</p> <p>Dehorning</p> <p>Health checks</p> <p>Breeding</p> <p>Tagging</p> <p><b>Secondary</b></p> <p>Management</p> <p>Breeding purification</p> <p>Animal classification</p> <p>Land walks</p> <p>Growth tracking</p> <p>Facility improvements</p>	<p><b>Primary</b></p> <p>Milk</p> <p>Calves</p> <p>Slurry</p> <p>Heifers (if the herd has too many)</p> <p>Muck (for fertiliser or to produce energy)</p> <p><b>Secondary</b></p> <p>Gas</p> <p>Cull cows</p> <p>Left over straw and silage</p>	<p>Tomlinson dairy</p> <p>Other farmers</p> <p>Pick stocks</p> <p>J bradburn price</p> <p>Wooley Brothers</p>

**Family farm facts**

**80%**  
Family farms make up about 80% of Britain's agricultural landscape.

**1-2**  
On average, 1-2 people work on UK family farms.



### National Farmers Union Wales (NFU)

The NFU is a very structured and well thought out organisation which helps all industries in agriculture. They are made up of Local Branch Committees within each County discuss issues and decisions which are then passed on to a full Committee at each of the 11 County levels. Welsh Boards then decide and agree policies which are then put to politicians and officials when making decisions on agricultural issues in the Welsh Assembly.

#### There current and future aims

**The main aim is to build better, fairer supply chain relationships.**

There are lots of examples of good relationships between farmers, processors and their customers but this is not apparent on the whole. The NFU Dairy Board will identify and promote best practice as well as encouraging others to follow. This work-stream includes our work on milk contracts plus developing whole supply chain relationships.

**Transform the environment to ensure a better future for our dairy farmers.**

**Building a better business environment: ensuring farm competitiveness**

### Department for environment food & rural affairs (DEFRA)

DEFRA are the UK government department responsible for safeguarding our natural environment. They play a major part in the food we eat the air we breathe and the water we drink.

DEFRA showcase information for anybody to access and help farmers and make the public aware of issues that are present in the farming industry at present. This is such an important role for them as they are a link from farmer to customers which makes the public aware.

**defra**  
Department for Environment

### AHDB

The agriculture and horticulture development board are levy funded they try to work on behalf of British dairy farming. They are helping the industry change and develop to ensure a bright future for all aspects of the industry. As an organisation they also help promote a good image for farming weather that is dairy, beef or arable so there work is valuable to the industry as they are the voice that tries to represent the farmer.

AHDB Dairy is funded entirely by milk producers, via a statutory levy on all milk sold off-farm, at the rate of 0.06p per litre. This provides an annual income of around £6.5m. This is a large amount of money considering there is only 317 dairy farmers in north east Wales in September 2017. They also supply data on the following important aspects of farming cow numbers, milk yield, and Dairy Farmers income.

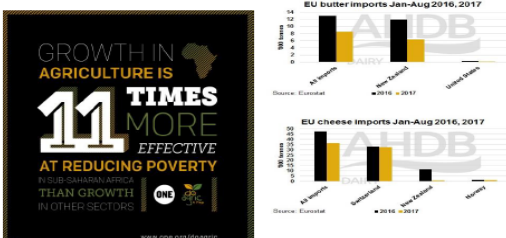
#### Their vision

**'Promote world class knowledge to British dairy farmers so they can profit from a sustainable future'**

AHDB Dairy's successful delivery of this will be demonstrated by:

**'World-beating dairy farmers thriving in a vibrant industry - without levy support'**

AHDB have reviewed milk prices and have come up with optimal dairy systems to help farmers and processors work together to get the best value for the product. These are block calving and all year round calving. To evaluate the AHDB help dairy farming as they make the farmer aware of the economic importance of their products and additionally makes us as the producers and the consumers aware of the level of imports entering the country on a regular basis. This not only helps us as the farmers it may help the processors and make them aware of the import levels of products like butter.





## Assured farm standards (red tractor)

The red tractor is the largest food standards scheme in the UK they ensure that standards are met in many areas of farming for example:

Food safety

Environmental protection

Traceability

Animal welfare

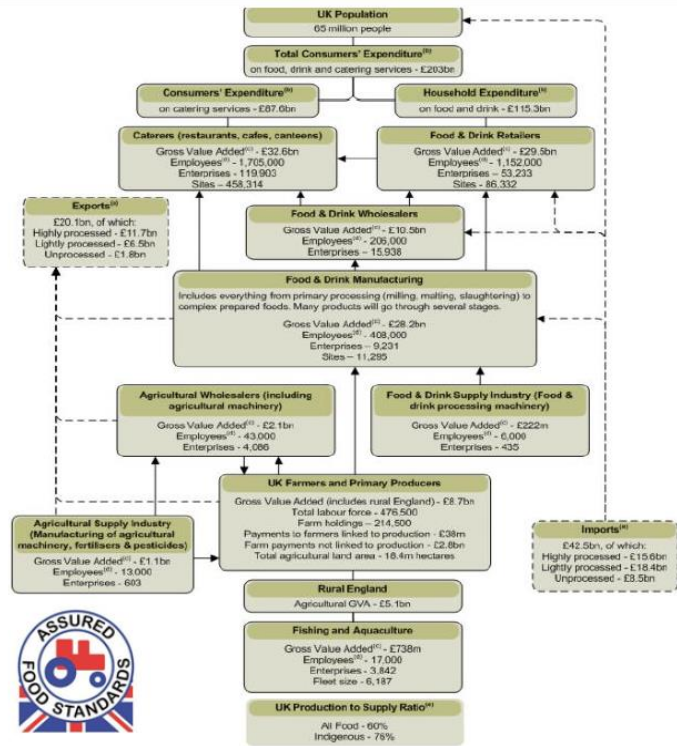
The AFS try to help the standard of farming remain high and further develop. I believe is a very important thing they supply guidance on all aspects of livestock from feeding to bio security and disease control. This guidance has to be practised and is compulsory to achieve their standard. 75% of UK farms are red tractor assured.

## Farming in wales data

- 58,300 people in wales were working in the agriculture sector in 2015 there was 3,113,000 living in wales
- The value of milk and milk products fell by 11% (£395 million) to £3.30 billion as the average farm gate milk price fell by 7.8% during 2016 across the UK as a whole.
- The value of food, feed and drink exports increased by £1.6 billion an increase of 8.7% to £20.1 billion. However the
- Value of food, feed and drink imports increased by £2.5 billion an increase of 6.7% to £42.6 billion.

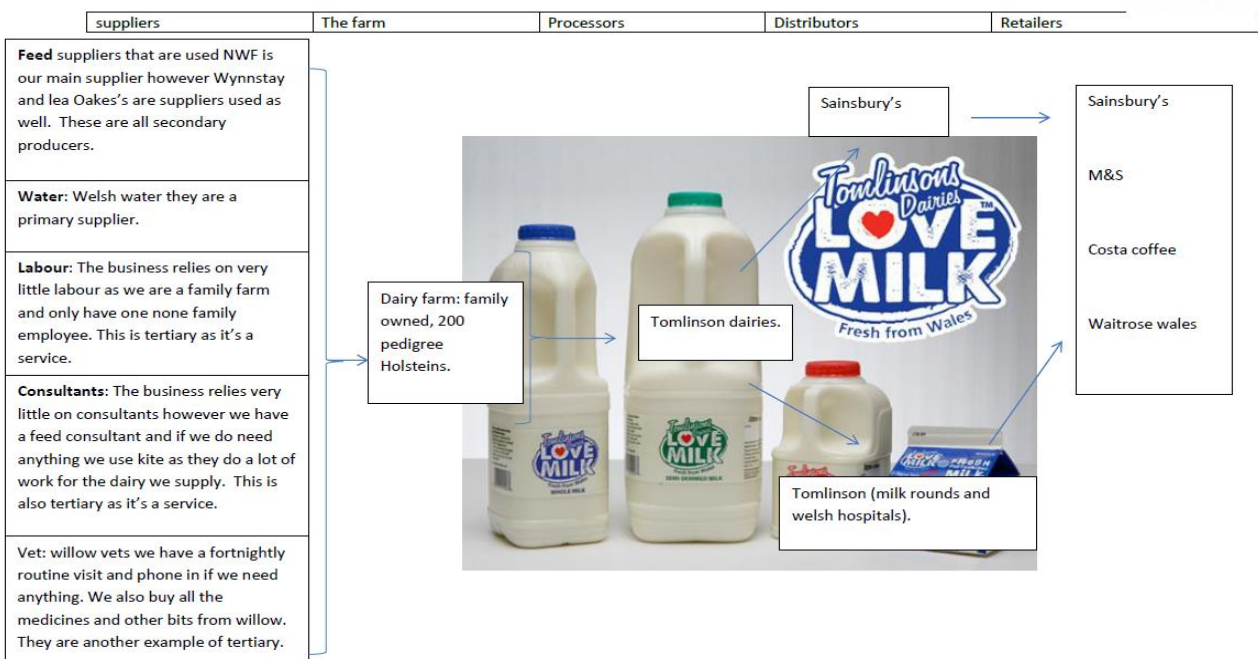
## The dairy industry across the UK and its production levels

After many annual price increases the price peaked in 2015 it was at its highest level since the 1980s. However 2016 saw a bold decrease of milk production by 3% to 14.5 billion litres. The average milk price in 2016 was 22.7 ppl this included bonuses, this was a staggering decrease compared to the previous annum were the average price was 24.7 that means there was a decrease of 7.8%.



This diagram shows the financial summary of the food chain. The dashed lines show main trade routes. Furthermore the diagram shows data on things like total farm holdings and the gross value added to the economy this is by products and industries.

## The dairy industry supply chain





### **Summary**

Dairy farming over the years has faced some tough times and some very good times however the industry has lots of obstacles to overcome those being supermarket superiority and issues like TB. The industry has moved with the time with the increase in technology however the milk price hasn't developed to help farms thrive it holds a lot of business back. It has also finished lots of farms as they just couldn't afford to carry on, this is sad to see as a young farmer as the rise of factory farms in the last ten years has changed the way milk is produced as there are now more three hundred cow herds which must have affected the number of family one hundred cow farms. The highs and lows of the industry also worry me as a future dairy farmer as I have seen local farms come and go over the last five years. This means that the future generation farmers have to be increasingly efficient and more in touch with their customers as they are the solution to a very big problem weather that is the dairy industry or beef and sheep. I also believe farming has an amazing and interesting future with the decision to leave the EU as this could mean less funding and this may also mean different trade routes. The future is also very uncertain with the uncertainty of funding. if this was ended it would mean for family farms like mine could thrive even more as we don't get a great amount of funding and it could mean lower land prices and therefore a huge opportunity to expand which is a target of the business currently as we struggle in the area to compete with hill farmers.

The uncertainty of the TB crisis could destroy our business and create opportunity for other farmers. However I think the increasing use of technology in the farming industry will help eradicate TB and other diseases as it will aid the farmer and make them more aware of what has potential to go wrong. However I believe technology will also have its short falls in the industry as it will potential aid un wanted change in the industry. I would also hope that in the future that there is a bigger uptake to farming occupations as this will also help make the public more aware of the industry and it is a good way of life.

Overall the future of dairy farming is very uncertain however if we look were we have come from the future can only be bright. With the an uncertain future only comes opportunity because at the minute the industry is looking healthier than in the past this also helps farms develop and be able to survive in the bad times. In my opinion the industry has two routes one will take us on a familiar road of supermarket domination and the other brings farming closer to its customers and sees fair and good product prices as a reality.

### **Bibliography**

<https://www.nfu-cymru.org.uk/home/>

<https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs>

<https://ahdb.org.uk/>

<https://www.redtractor.org.uk/choose-site>

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/629226/AUK-2016-17jul17.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/629226/AUK-2016-17jul17.pdf)

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## Example 2 of SIPOC completed by student

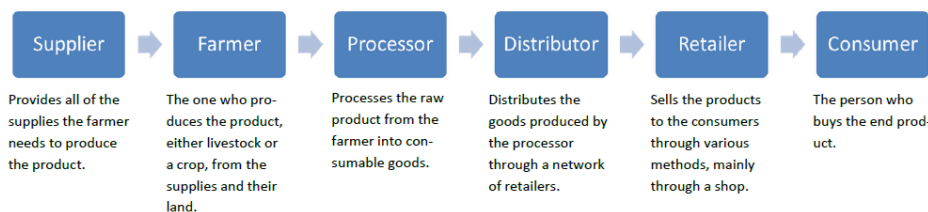
### SIPOC Poster for a Dairy Farm

S	I	P	O	C
Supplies	Inputs	Processes	Outputs	Customers
Feed (Wynnstey)	Labour	Milking	Milk	Milk Processor (Arla/Muller)
Water (Severn Trent)	New Stock	Feeding	Silage	Markets (WLS)
Bedding (Dealer/Own Straw)	Contractors	Bedding	Slurry	Other Farmers
Utilities (Scottish Power)	Accountant	Silaging	Cull Cows	Abattoirs (ABP)
Markets (WLS)	Agronomist	AI	Calves	Public (Farm Shop)
Vets (Four Crosses)	Medicines	Calving	<b>Secondary Outputs:</b>	
Fertiliser (Wynnstey)	Transport	Health Management	Leather	
Seed (Wynnstey)	Buildings	TB Testing	Tallow	
Chemicals (Wynnstey)	Insurance	Foot Trimming	Bones	
Fuel (Owens)	Bank (Finance)	Maintenance	Cheese	
Parlour Maintenance (Ralph Atkins)		Spreading Fertiliser & Slurry	Yoghurt	

The SIPOC Poster shows that there are a wide range of industries connected to agriculture which are required for the industry to function properly. They all impact on the costs of the business but without them the business would not run effectively. An example is feed supplied by Wynnstey. This is required for optimum cow health and milk production, but adds to the costs. The profits gained by feed use do however outweigh the costs. Water supplied by Severn Trent is a vital commodity for milk production, but still has a cost and without it the cows would die.

### Fact Sheet

#### The Supply Chain:



#### Associated Businesses:

##### Defra:

Defra is the government department for agriculture. Defra stands for the Department for Environment Food & Rural Affairs. They are the ones responsible for creating laws regarding agriculture and the countryside. They are a government department which means that they are funded by tax payers' money.



##### AFS (Red Tractor):

The Assured Food Standards run the Red Tractor scheme. This is a scheme designed to promote the highest standards of British food. To meet the standards the farm must have very high welfare and only use medicines when necessary. This ensures that the customer can be confident about where their food has come from and how it was produced. They are a non-profit company and their funding comes from assured members, licensees, and others in the supply chain.



##### NFU:

The NFU is the National Farmers Union. They are responsible for protecting farmers' interests in government affairs. They support farmers in issues such as the badger cull and Brexit, and fight against restrictive legislation such as glyphosate banning. The NFU is funded by its members, however membership is free for students and YFC members.



##### AHDB:

AHDB stands for the Agriculture and Horticulture Development Board. Their main job is research and development of agriculture. They cover all aspects from livestock to arable, and from their research they provide easy to use figures and statistics. These can be used to help farmers grow their products more efficiently. They are funded by farmers, growers and others in the supply chain, and are managed independently of the government.



#### Summary of Businesses link:

All four of the associated businesses are linked together, and all impact farmers in different ways. A good example is the introduction of the sprayer MOT. This legislation would have been introduced by Defra, and fought against by the NFU. The AHDB would have tested and analysed the impact that MOT's would make and provided an input. Finally once everything was agreed the AFS would have introduced MOT's into their compliance documents to roll out the changes to farmers.







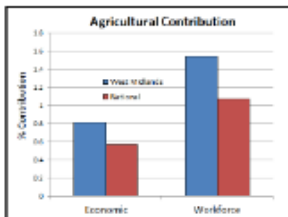
## Fact Sheet Continued

### Summary of agriculture in the West Midlands:

The West Midlands makes up 10.4% of England's total farmed area. The average farm size is 68ha compared to the national average of 86ha. Around 30% of ground is rented compared to the national average of 33%.

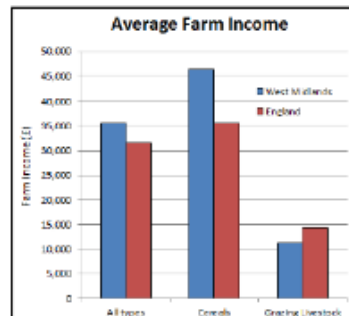
There is a large variety of different types of agriculture in the West Midlands. The two main types are grazing livestock and cereals and general cropping. Data from Defra is included in this fact sheet that shows a breakup of the different areas of agriculture in the West Midlands and England as a whole.

### Economic Contribution of Agriculture:



Farm income is typically higher in the West Midlands, however grazing livestock incomes are below the national average. The average number of workers per farm is 3.1 in the West Midlands, with 40% being full time. Nationally it is 2.9 with 45% full time. Total farming income decreased by 12% between 2011 and 2015 to £332 million.

As the graph shows, agriculture in the West Midlands contributes more to the regional economy than agriculture does nationally. It also has a greater workforce percentage contribution than the national average.



### Past, Present and Future:

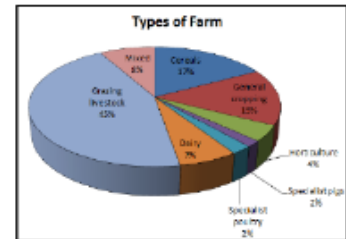
Technology and scale of production have come a long way in 50 years. The common dairy farms in 1960 had less than 100 cows and used six a side herringbone parlours.

Most modern dairy farms now have well over 100 cows, and some even go beyond 1000. Common parlours range from ten a side herringbones to 70 point rotaries.

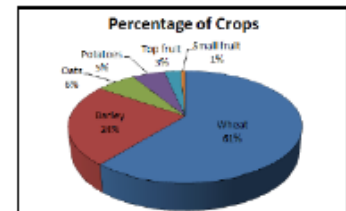
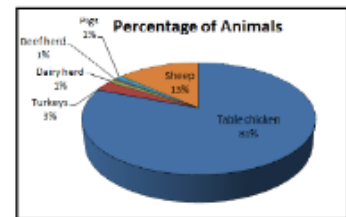
The farm machinery has drastically changed too. In the 1960's a common tractor would be between 35 and 65hp. Most of these are now relegated to scraping duties while the average tractor is around 150hp.

In the future there will be greater focus on automation and the use of robots and drones. GM crops could also become widespread in the bid to increase food production.

### West Midlands Sector Percentages:



Although dairy is a smaller sector, the greatest income to the local economy comes from milk. This is followed by poultry, beef cattle, wheat and fruit.



## References

- <https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs>
- <https://www.nfuonline.com/about-us/>
- <https://logo.redtractor.org.uk/what-we-do>
- <https://ahdb.org.uk/about/default.aspx>
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## Impact of changes and use of SIPOC'S on the student learning experience

Students have reacted with enthusiasm to the use of SIPOC tools as part of their learning. They enjoy the increased practical element compared to "chalk and talk" and they are particularly positive about the way that they are able to work independently and apply their learning.

Since we changed the curriculum take-up of this module has increased by 250%.