



# Improving the Feed Supply Chain

## Bernard Matthews and Saxon Agriculture Case Study

Almost one-fifth of the UK's wheat crop goes into poultry feed and, although feed supply chains are often short and integrated, there are opportunities to improve performance even in these commodity chains.

A Cereals Industry Forum value chain analysis project conducted with Jeremy Mason, an arable farmer, Alan Wymer - Grain Trader and Kevin Bindon - Logistics Manager, from Saxon Agriculture and Jane Biss from Bernard Matthews, identified five areas of opportunity:

- Better communications by improving the flow of information at various stages in the chain to improve operational efficiency
- Reducing transport delays and inefficiencies
- Identifying the optimal points to hold inventory across the chain
- Reducing the frequency of grain sampling
- Better risk management across the supply chain

### The Value Chain Team



*"I feel we have a good working relationship in general, and that both parties would be willing to investigate these 'new concepts' so as to introduce new benefits,"*

Jane Biss, Bernard Matthews

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Case  
Study

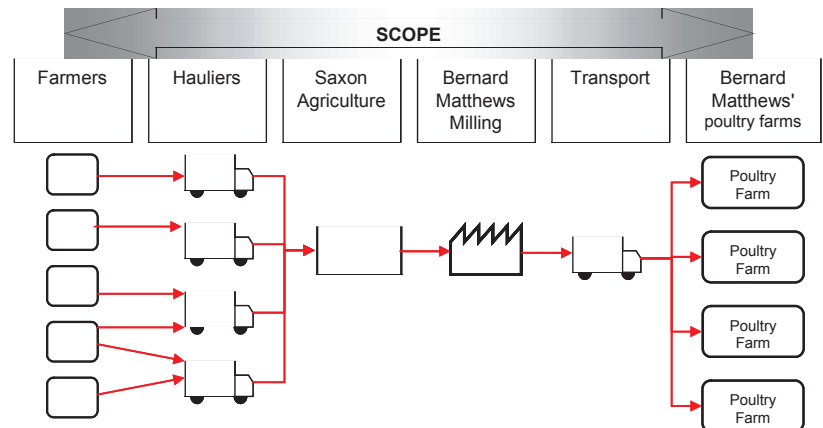
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2006

*“We are already an efficient chain but taking part in this project brought a new understanding of the supply chain that could help us improve our performance.”*

Jeremy Mason, Arable Farmer

## Poultry Feed Supply Chain

The value chain analysis project covered the chain from when grain is traded to the point the feed is delivered at the poultry farms.



The specific objectives for this project were:

1. To analyse the current supply chain
  - Create a process map of the supply chain
2. To analyse collaboration across the Supply Chain
  - Produce a Supply Chain Collaboration Index (SCCI)
  - Conduct collaboration interviews for specific relationships
3. To improve the current situation
  - Identify opportunities to eliminate waste
  - Create a 'Future State' vision agreed by the companies
  - Produce recommendations to achieve that vision
  - Agree an action plan



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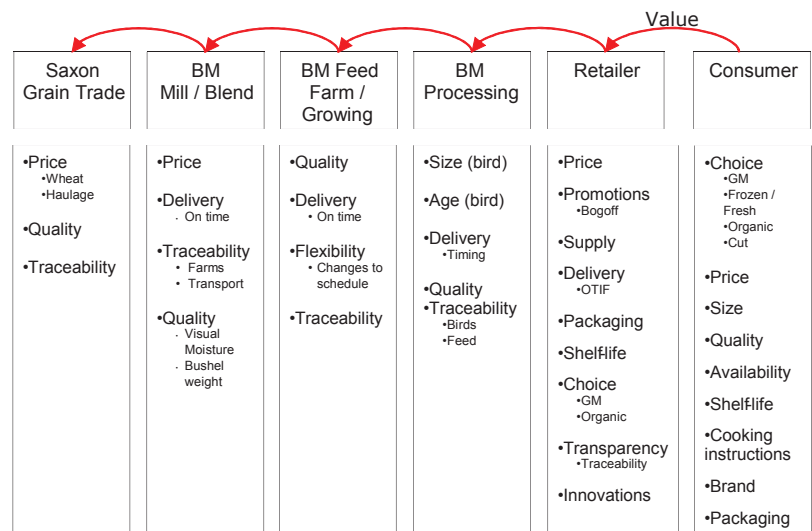
The starting point for this project was to obtain an understanding of value at every stage in the chain. In a supply chain this can be complex, since each participant in the chain will have their own needs and expectations about what their internal or external suppliers should deliver.

By understanding value it is possible to identify activity that does not add value, and seek to reduce or eliminate it.

There are many difficulties in defining and measuring value, but in this case precise definition or measurement was not necessary. What was required was a general understanding of how value is perceived across the supply chain, making it visible to all participants.

In order to create this picture of value, a team of four people from Bernard Matthews and Saxon constructed a map of value in the supply chain by brainstorming and analysing value at each stage of the process.

### Value across the supply chain



This value map was used throughout the process to understand the impact of various activities on customer value, and to define non-value adding activities in the supply chain.



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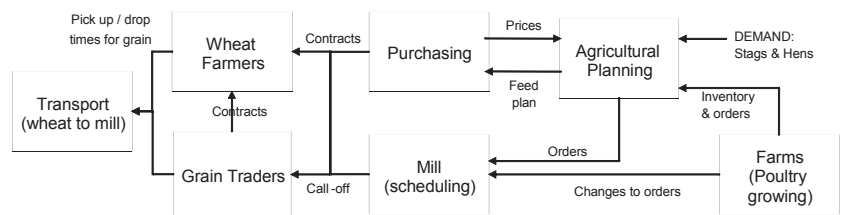
It is interesting to note that the value proposition changes substantially through the chain. Earlier stages focus mainly on price and to some degree on quality and delivery, indicating the commodity status of the product at the earlier stages of the chain.

However, at the retailer and consumer end, the value proposition appears to be considerably more complex, with the emergence of issues such as choice, brand, packaging, innovation and promotions.

### Information Flow

The flow of information is an essential element of supply chain processes, since it determines the timing and volume of materials being supplied. Furthermore, delays or interruptions to this flow or inaccuracies in the information provided, can cause severe disruptions in the flow of materials that can result in shortages or poor customer service.

### Information flows



In the diagram, data and information flow from right to left. Information about the total demand for birds flows from the processing plants (which is the aggregated demand of a wide range of products). This information flows down to the Agricultural Planning department, which is responsible for producing a bird plan, generating the optimal feed formulations (depending on nutrition requirements and raw materials prices), and producing a feed plan. This process is sensitive to the quality and variability of information.

Analysis showed that some elements of demand are very stable (stags) while others (hens) are highly variable, causing constant changes to the plans.



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The farms rearing birds will have demand for feed, which depends on the number of birds, their age and the current inventory levels. A potential source of inaccuracies comes from the measurement of inventory at the farms, which can cause sudden changes to orders.

The feed plan is communicated to the purchasing department, so that they can procure the materials from suppliers. These plans are produced monthly, with weekly updates.

Wheat, which is the main raw material for feed, can be purchased from two main sources: grain traders and farmers. The product is purchased on the open market where price is the main criteria.

The commodity status of wheat is one element of buyer-supplier relationships, which are largely transactional. Information exchange is usually restricted to price and volume, although suppliers do not have visibility of future demand. Deals are closed on the telephone and standard contracts are used.

*“Getting more information in terms of timing and volumes might allow us to serve them better.”*

Alan Wymer

Saxon Agriculture

Agricultural Planning also sends order information directly to the mill. The mill is then responsible for scheduling and producing the required amount of feed, and delivering it directly to the farms.

Farms can also contact the mill directly to make changes to orders. Although this creates flexibility for the farms, it can also create disruption, since it is necessary to reschedule at the mill, and in some cases time can be wasted due to unnecessary changeovers from one formulation to the next. Our work indicates that an average of around 10 hours a week are lost due to ration changes which are caused by changes to orders (for example, cancellations or emergency orders).



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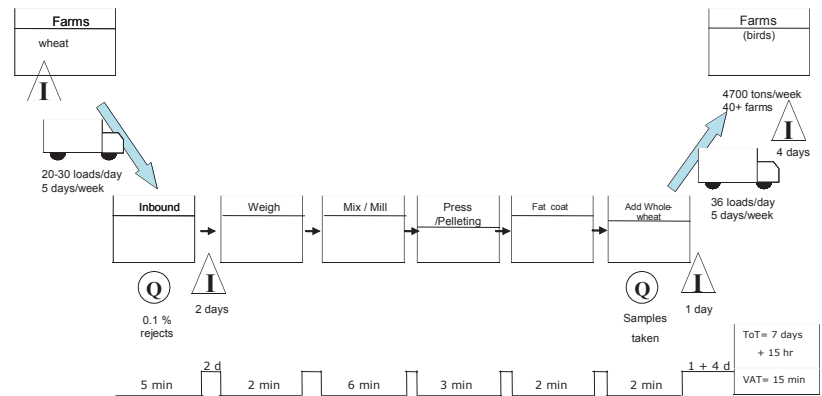
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## Product Flow

The physical flow for the feed supply chain starts and finishes at the farm. At one end are the farms producing raw materials and at the other the poultry farms consuming the feed.

## Physical Flows



I = Inventory

Q = Quality

Tot = Total

VAT = Value Adding Time

Wheat is usually transported directly from the farms to the mill, which receives 20-30 loads per day (600t). The deliveries can occasionally be unreliable but generally deliveries arrive on the requested day. Until all farms can load within a smaller timescale i.e. 1 hour and will load in all weathers delays/cancellations will occur. Rejection of load at previous tip may also delay or lead to cancellation of load.

On arrival, deliveries are visually inspected and tested for moisture and bushel weight. However, this is not the first time the grain is tested, in fact it might have been tested on several occasions (by a number of merchants) before delivery, which is unnecessary activity. Although these tests are important, less than 0.1 percent of loads are rejected and quality of raw materials is not deemed to be a problem. Following inspection, raw materials are stored in silos which hold an average of two days' stock.

The mill usually operates 5 days per week and produces around 950 tonnes of feed per day, enough to satisfy around 95% of Bernard Matthews' requirements. The milling process is continuous, with a cycle time of around 15 minutes.



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Four main types of rations are produced at the mill. The changeover time between rations takes about 15 minutes, and as a result, modifications or cancellations of orders can have a substantial impact on production. Downtime was found to be less than 10%, and a large proportion of this can be attributed to ration changes.

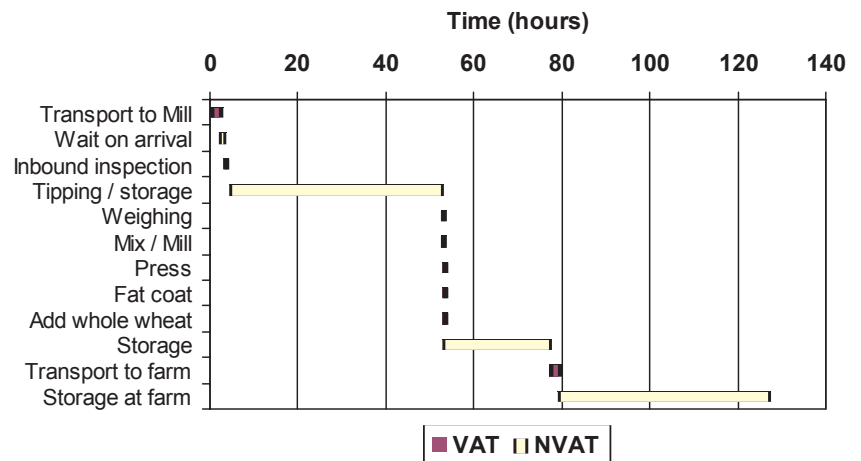
The finished feed is stored in silos, ready for distribution to the farms. An average of one day's stock is held at the mill.

Distribution of feed is controlled at the mill, using Bernard Matthews' own fleet. This helps to maintain control over the operation and to ensure that farms receive their timely supply of feed. On average 36 loads per day are delivered, five days per week. It was found that this transport operation was more efficient and reliable than the inbound distribution of raw materials into the mill.

### Time Line

The diagram shows that there is a large proportion of non-value adding time (97 %); however, most of this is storage time at various stages. The milling activities are in fact very efficient, with an overall cycle time of around 15 minutes and practically no interruptions.

### Time Based Process Map



Despite the large proportion of storage time, it is recognised in this industry that wheat has to be stored at some point in the process and that attempts to reduce stock would simply result in moving it from one stage in the supply chain to another. The question is not about how much inventory is held, but where the optimal holding point is.



## Collaboration

The analysis was completed by conducting a survey and interviews with staff at Bernard Matthews and Saxon Agriculture to understand each other's perspective on the relationship between the two companies.

The results suggested a moderately successful relationship characterised by co-operation based on the need to overcome normal supply chain operating difficulties. Both parties recognised that they operate in a commodity market where price is the main decision-making criterion and they approached this in a pragmatic way.

## Improvement Plans

The agriculture industry is going through a period of change, which makes long-term planning more difficult. However both parties committed themselves to an action plan based on five issues.

- Better communications by improving the flow of information at various stages in the chain to improve operational efficiency

The value chain analysis revealed that details of inventory levels at the poultry farms were not always visible. This was creating disruptions in orders and required scheduling changes at the mill leading to unnecessary changeovers and wasted time.

- Reducing transport delays and inefficiencies

Transport of raw materials into the mill was identified as a "potential" issue in terms of both cost and reliability.

*"To improve the relationship I think we can look at the haulage issue together. It is one of our biggest costs and it can be a make or break."*

Kevin Bindon

Saxon Agriculture

The action plan identified three key areas of opportunity:



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- An analysis of empty miles in the chain will be undertaken to identify potential improvements, particularly through a more extensive use of backhauling
- Standardisation of processes for loading and tipping would help to improve waiting time across the industry;

Farmer - 1 hour maximum loading time and the ability to load in all weathers

Consumer (Processor/Manufacturer) - Improve tipping facilities to decrease tip time and set a minimum intake period, for example 7am - 5pm.

- The use of a performance measurement system across the supply chain relating to farmer loading and consumer tipping would help to improve efficiency. This could be used as a mechanism for penalties and rewards on both sides.
- Identifying the optimal points to hold inventory across the chain

Inventory levels within Bernard Matthews are relatively low, however inventories in the chain are much higher and are usually held at farms.

- Reducing the frequency of grain sampling;

Grain was being sampled on farm by a number of merchants on several occasions. The use of an independent sampling service and the pooling of results would help reduce the wasted time/cost to the industry. Analysis could then be extended to include routine Mycotoxin testing.

- Better risk management across the supply chain



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- **Feed Production.** Most of Bernard Matthews feed requirements are produced at Bawsey Mill, this means that if the mill is not operational problems will occur both up and down the supply chain. However, this situation is difficult/impossible to plan for as downtime cannot be forecasted i.e., - could be a long-term problem (fire) or short-term problem (electricity supply).
- **Raw Material Supply.** The current system does provide ability to change formulations and the availability of alternative sources of raw materials allows the mill to cope with a lack of specific raw materials.

## Method

The work covered two essential aspects of supply chain management: the 'hard' elements of the process - ie activities, times and inventories - and the 'soft' elements - the personal and organisational relationships in the chain. These two aspects were analysed using different tools.

- **Value Chain Analysis:** helps to visualise and understand the flow of material and information as a product makes its way through the supply chain. Some of the main benefits of this tool are that it helps to identify waste in the process, supporting analysis of the linkages between information and material flows and serving as a basis for the implementation plan.
- **Supply Chain Collaboration Index (SCCI®):** the purpose of this tool is to capture quantitative and qualitative data to reveal the dynamics of long-term collaborative business relationships. Measurements from both sides of a collaborative relationship are taken in order to assess five key dimensions of the relationship – creativity, stability, communication, reliability and value – and seven additional characteristics – long term orientation, interdependence, C3 behaviour, trust, commitment, adaptation and personal relationships.

The outcomes of both approaches were used to produce a diagnosis of the supply chain, identifying key areas of opportunity and generating an action plan.



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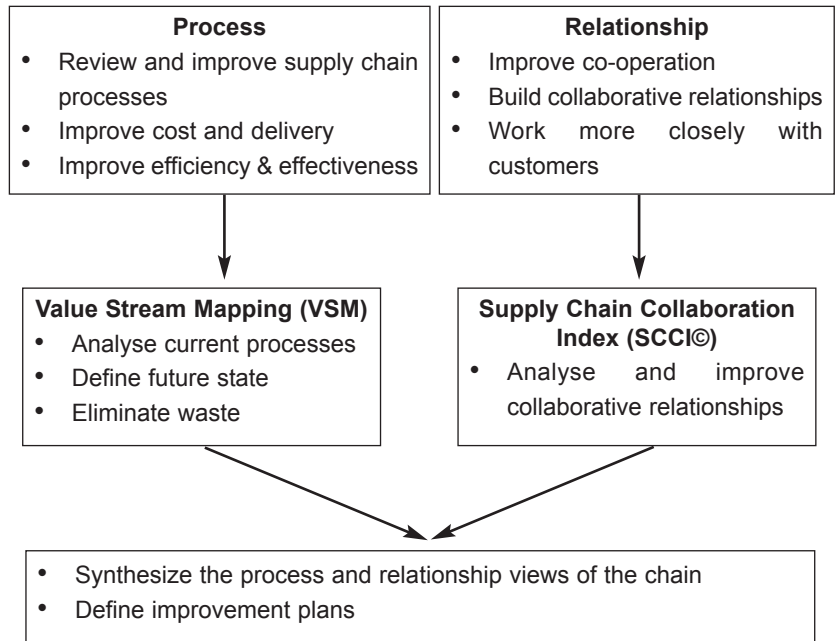


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This approach required a total of 11 contact days with the participants.



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## Methodology Deployment

Day	Event	Description
0	Project Launch	<ul style="list-style-type: none"> <li>Define scope, objectives and project plan</li> <li>Appoint relationship managers</li> <li>SCCI questionnaires are distributed</li> </ul>
1	Initial Orientation Workshop	<ul style="list-style-type: none"> <li>Present initial Supply Chain Collaboration results</li> <li>Introduce principles of successful supply chain collaboration</li> <li>Introduce Lean Principles, tools and techniques</li> <li>Agree on Team members and Diarise Events</li> </ul>
2	Workshop: Current State (Off-site)	<ul style="list-style-type: none"> <li>Select Product</li> <li>Construct a Current State Big Picture Map</li> <li>Identify possible quick wins</li> </ul>
3,4,5	On-site Mapping & Collaboration Interviews	<ul style="list-style-type: none"> <li>Map processes within each facility along the supply chain</li> <li>Conduct SCCI Interviews</li> </ul>
6,7	Workshop: Full Chain Current State Map (Off-site)	<ul style="list-style-type: none"> <li>Discuss SCCI report</li> <li>Update current state map with Quick Wins through project</li> <li>Brain storm ideal state and analyse top ideas</li> <li>Develop ideal state map based on consumer value</li> </ul>
8	Workshop: Future State Map	<ul style="list-style-type: none"> <li>Rationalise Ideal to Future State</li> <li>Ensure KPI alignment of projects</li> <li>Identify vital few projects</li> </ul>
9	Prepare Presentation	<ul style="list-style-type: none"> <li>Firm proposals to project sponsors, benefit allocations and milestones</li> </ul>
10	Presentation	<ul style="list-style-type: none"> <li>Joint presentation of recommendation to senior management</li> <li>Provide final report</li> <li>Decisions taken regarding improvement projects</li> </ul>



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