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Implications of Ingredient Availability – Opportunities for Vegetable Protein Meals

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JCS Solutions

FEED MANUFACTURE

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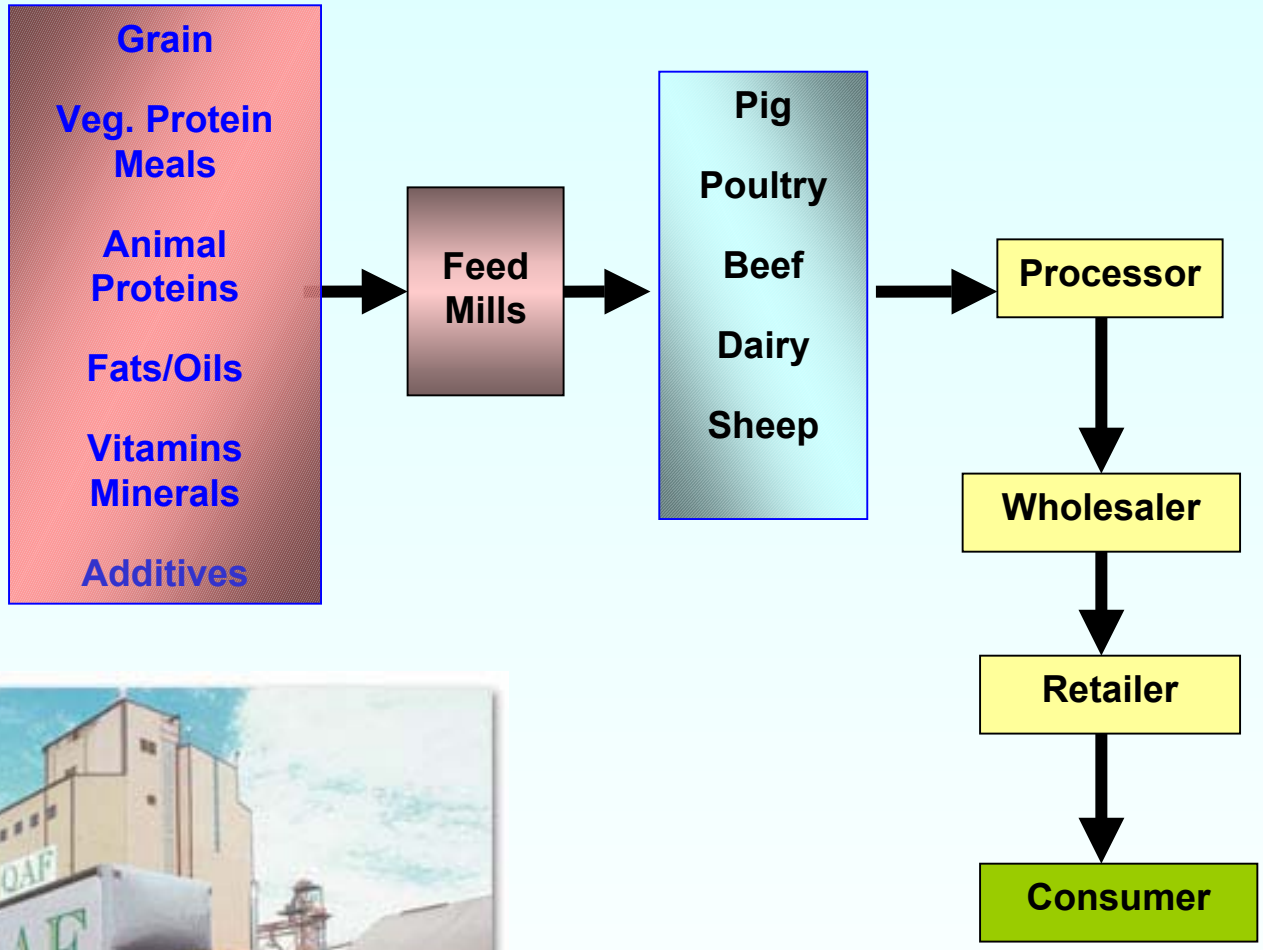

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NUTRITION

MEETING ANIMAL NUTRIENT REQUIREMENTS

FOR

DEFINED PERFORMANCE CRITERIA

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STOCKFEED INDUSTRY BALANCES

CUSTOMER (LIVESTOCK PRODUCER) EXPECTATIONS

VERSUS

COMMERCIAL REALITY

SUPPLY CHAIN ROLE

Estimated meal usage in 2004 (data from ARA and AOF)

Meal Type	'000 Tonnes	%
Animal Protein Meals	373	33.2%
Soybean Meal (domestic + imported)	350	31.1%
Canola (75% Sol, 20% Exp, 5% Cold)	225	20.0%
Sunflower	24	2.1%
Cotton (plus 140 kt whole seed)	130	11.6%
Copra	22	2.0%
	1124	

Plus pulses – peas, lupins, beans

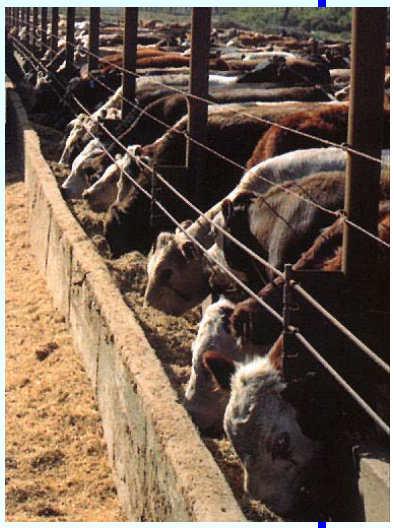
Estimated meal usage

Livestock Sector	Feed tonnes	Veg. protein usage - tonnes	Use rate - %
Pigs	1,698,000	233,000	13.7%
Poultry	2,730,000	340,600	12.5%
Dairy	3,010,000	150,000	5.0%
Feedlots	2,720,000	135,000	5.0%
Other	450,000	33,700	7.5%
Total	10,608,000	892,300	8.4%

JCS Solutions estimates

FACTORS INFLUENCING PROTEIN MEAL CURRENT USAGE

- INGREDIENT AVAILABILITY
- PRICE
- CONSISTENCY
- PROTEIN QUALITY



FEED INDUSTRY CAPACITY TO RAPIDLY SWITCH RAW MATERIAL USE

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PIG GROWER FEED

INGREDIENTS	High Animal Protein %	Typical %	No Animal Protein %
Barley	56.5	41.1	17.8
Wheat	22.3	25.6	39.3
Peas	0	10	20
Canola Meal	0	8	10
Soybean Meal	4.4	6.1	8.5
Meat Meal	9.3	6.4	0
Fish Meal	4	0	0
Blood Meal	2	1	0
Tallow	1	1	1
Limestone	0	0	1.2
DCP	0	0	1.3
Salt	0.01	0.25	0.36
Methionine	0.01	0.03	0.04
Lysine	0.18	0.23	0.25
Threonine	0.04	0.04	0.05
Premix	+	+	+

Protein (%)	20.1
DE (MJ/kg)	13.5
Fat (%)	3.9
Calcium (%)	Min 0.9
Phos. (%)	Min .65
Sodium (%)	0.17
Lysine (%)	1.17
M+C (%)	0.7
Threonine (%)	0.74

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Computer formulations

- **Breakpoints defining use or non use prices**
- **Parametrics defining how much to use at differing prices**
- **Value for each raw material relative to others**
- **Varies for each feed type and specification**

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================================================    JCS Solutions     (3601) ================================================
:                                                                                                                          :
:       AUSIMIX          (RUN)     FEED MILL MASTER       {4} JULY 2005           OPTIMIZATION RESULTS       15:16 02/08/05  0014 :
: 01-April-2002/216.2                (    1) Plant=0088      John                                                          :
============================================================================================================================

----------------------------------------------------------------------------------------------------------------------------
: SP:      60002 PIG GROWER FEED                          100.0     %,  1000.0   Kg (Recost:  325.61 ) Optimal cost:   288.96  :
----------------------------------------------------------------------------------------------------------------------------

      INCLUDED RAW MATERIALS            %        Kg       Cost    Lim  Minimum   Maximum  Lower Cost   New %  Upper Cost   New %
---------------------------------- --------- -------- ---------- --- --------- --------- ---------- -------- ---------- --------
     10200 BARLEY 11.0               56.4781   564.781   200.0            .       80.0       176.945  61.8421    225.149  56.3587
     14200 WHEAT 13.0                22.3187   223.187   210.0            .       90.0       180.367  22.42      232.075   1.5651
     28450 PEAS-FIELD 22.0            0.0001     0.001   230.0   MAX      .        0.0001       .        .       248.589   0.0
     36220 CANOLA MEAL 36.0           0.0001     0.001   280.0   MAX      .        0.0001       .        .       447.559   0.0
     37840 SOYBEAN MEAL 48.0          4.3888    43.888   650.0            0.0      99.0       450.709   5.0093   764.628   4.3283
     40050 BLOOD MEAL 85.0            2.0       20.0     600.0   MAX      .        2.0          .        .      1177.189   1.2377
     40700 MEAT MEAL 50.0             9.3083    93.083   320.0            0.0      10.0     -2298.184   9.3083   349.454   5.1097
     41190 FISH MEAL 60               4.0       40.0     820.0   min      4.0       5.0       723.028   4.0715      .        .
```

Protein meal use trends

- **Reducing inclusion meat meal – consistency in quality, salmonella, forward supply variability**
- **Reduced recycling poultry meals back to poultry**
- **Increased use of synthetic amino acids – lower price, Chinese influence**
- **Poor harvest supplies and competing demand - peas, lupins**

FACTORS FAVOURING VEGETABLE MEALS

1. BSE – Bovine spongiform encephalopathy

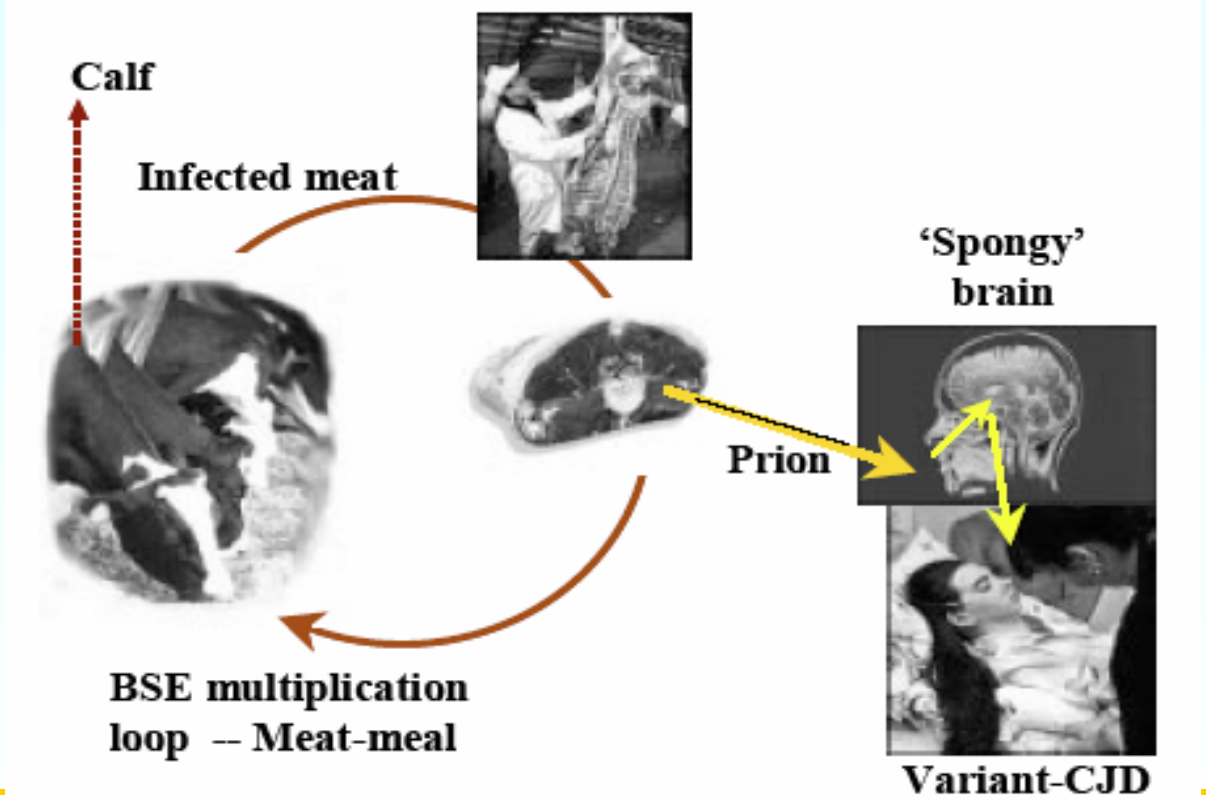

Figure 1 Factors enabling multiplication of BSE, the transmission of BSE to humans by ingestion of BSE–infected meat, and the development after an 'incubation period' of perhaps decades of clinical signs of vCJD.


BIOHAZARD


TIERMEHLFREI
BSE
BIO
UND DOCH ORGANISCH
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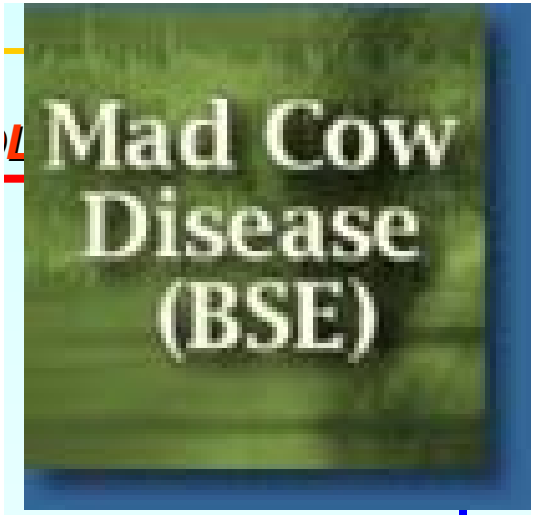

Mad Cow
Disease
(BSE)

Australian BSE Control Programme

TSE FAP

- **Quarantine AQIS – stop entry**
  Livestock, stockfeed, meat

- **Surveillance Sampling & Testing suspect cattle and sheep**
  NTSESP

- **Tracking live cattle imported and zoo animals**

- **Feed Ban – RAM (Restricted Animal Material) in ruminant feeds**
  Site audits -renderers, mills, end user farms, retailers
  Sampling and Testing

Ruminant Feed Ban Issues

- Feed mills must ensure no cross transference RAM into ruminant feeds
- Mills not designed to be contamination free
- Expectations of zero tolerance
- Assays to identify small quantities
- Compliance pressure being applied to feed manufacturers

Potential Australian Scenarios

1. Ban MBM use – Eliminates the BSE risk

= EU ban on feeding animal proteins to livestock

2,500,000 tonnes of wet material processed by renderers

Value of rendered animal protein $500M annually, approx 50% exported, loss of foreign income.

Environmental disposal problem

NOT A LIKELY OUTCOME WHILST WE DO NOT HAVE BSE

Potential Australian Scenarios

2.Feed Industry Dedicated Feed Mills

Capital cost $180M to replace lost capacity – 60 mixed species mills

Increased manuf. cost $14-22M/annum - lost efficiency

Increased feed delivery costs $4-11M/annum - dedicated delivery vehicles.

Not likely that dedicated feed milling will be forced on industry through regulation

INDIRECT RESULT OF INCREASING FEED SAMPING AND TESTING

US FDA Feed Ban Rules – Oct 2005

Removal of specific risk materials from the animal feed chain

- **Cattle > 30 months**

Through the removal of SRM's from meat meal, this reduces the risk of cross contamination and need to have dedicated feed mills.

Identifies the critical control point before the point of rendering

- further up the supply pyramid

Potential Australian Scenarios

3. Feed mill options

1. Sequencing and flushing – slows production and increases manufacturing costs, not 100% guaranteed.

2. Cease the manufacture of either monogastric or ruminant – loss of business.

3. Upgrade site to segregate production lines – capital cost

4. RAM free in all feeds – increased raw material cost

We are seeing a combination of responses

Resulting pressure on meat meal, blood meal, poultry meal, fish meal use

FACTORS FAVOURING VEGETABLE MEALS

2. NON GM FEEDS

"The GM food standard requires that the food must be labelled if there is altered DNA or protein in the final product" - FSANZ

Consequently dairy, meat and eggs from animals fed GM feed are not required to be labelled as GM within Australia

GM use in animal feeding is:

- **Export trade issue**
- **Not a regulatory domestic labelling issue**
- **Not a food safety issue**

NON GM FEEDS – Chicken Meat

- 3 Major broiler companies
- Use best endeavours to source non-GM ingredients for poultry feeds
  - meet quality standards
  - available in substantial quantities
  - economically sustainable

"The use of GM Soya in feed does not compromise the absolute GM-free status of the poultry products the company produces. Animals that eat feed with a component of GM Soya are no different to other animals that may have been fed a low GM or GM-free diet" Ingham's GM Policy Statement

Commitment to non GM raw materials significance

- Responded to calls from activists
- Ability to access South American soybean meal, lower cost than US GM soybean meal
- Vegetable meals, animal meals and pulses all non GM

Favours use of non GM Australian vegetable protein meal sources

Non GM and other livestock industries

Dairy – governed by milk processors and meeting export market demands

Varies from nil to no limit

Feedlot - dependent upon beef export destination

Pig - little attention, large use of soybean meal, low level meat exports

FACTORS FAVOURING VEGETABLE MEALS

3. CORPORATE FARMING

- Decline in smaller scale home-mixing – bagged meal sources
- Contract feed supply
- Larger feed mills
- Capacity to utilise bulk materials
- Forward contract supply
- Livestock performance consistency

FAVOURS VEGETABLE PROTEIN MEAL USE

FACTORS FAVOURING VEGETABLE MEALS

4. LIVESTOCK PRODUCTION EXPANSION

	Feed Tonnes		
Livestock Sector	2005	2010	2020
Pigs	1,698,000	1,785,000	2,052,000
Poultry	2,730,000	3,059,000	3,976,700
Dairy	3,010,000	3,310,000	3,972,000
Feedlots	2,720,000	2,886,000	3,319,000
Other	450,000	495,000	594,000
Total	10,608,000	11,535,000	13,913,700

JCS Solutions estimates

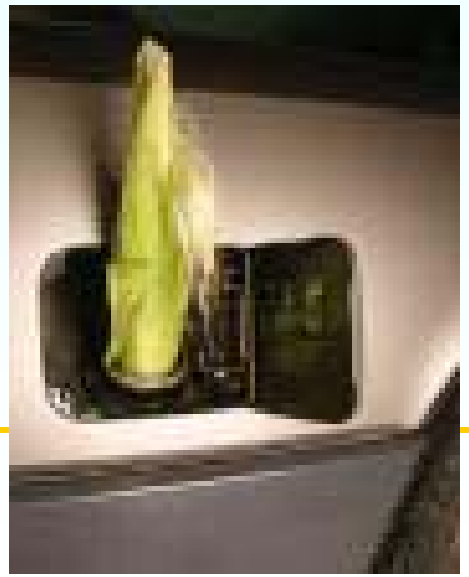
5. Biofuels – impact upon vegetable meals

Ethanol from feed grains -VE IMPACT

- Supply of by-products
- Wet distillers grains
- Dried distillers grains 30% protein

Tallow and cooking oils use – reduce lower cost energy source

Canola oil – increased canola meal supply



Implications of Ingredient Availability
Factors Favouring Vegetable Meals

	Vegetable Protein Meal Demand		
Livestock Sector	**2005**	**2010**	**2020**
Pigs	**233,000**	**306,600**	**353,300**
Poultry	**340,600**	**412,000**	**526,500**
Dairy	**150,000**	**186,500**	**222,900**
Feedlots	**135,000**	**147,200**	**169,700**
Other	**33,700**	**38,600**	**46,250**
Total	**892,300**	**1,090,900**	**1,318,650**
INCREASED DEMAND		**+ 22.3%**	**+ 47.8%**

Alternative supply US/S. Amer. soybean meal, animal proteins and/or pulses

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