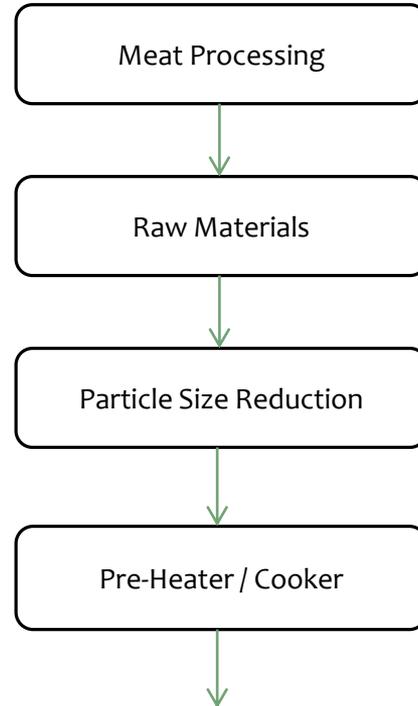


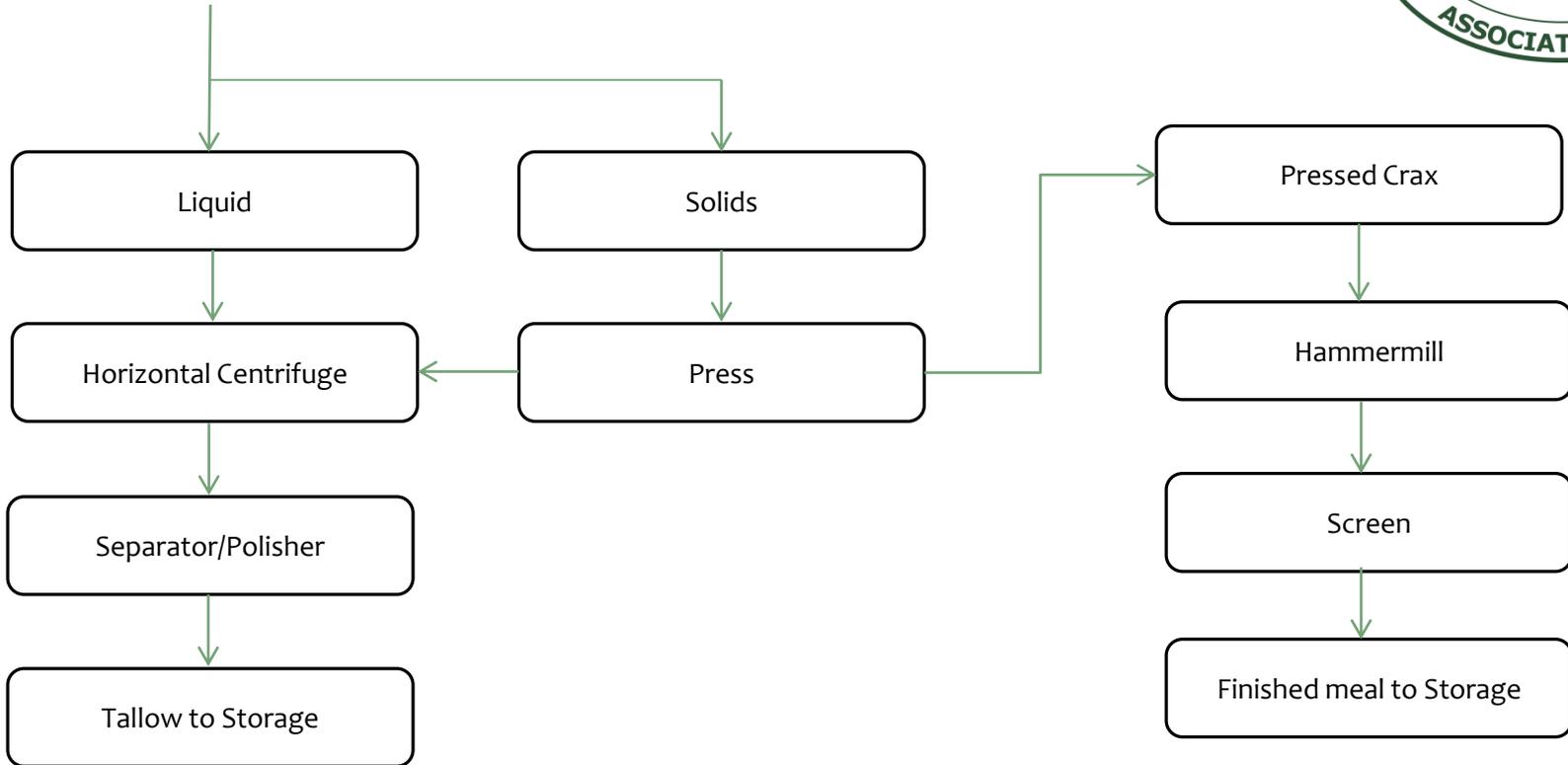


# Rendering – An Overview

Dennis King  
Executive Officer  
Australian Renderers Association

# Rendering Flow Chart







## Particle Size Reduction

The raw material is broken down into uniform sized pieces to ensure all pieces are heated to the required temperature to ensure correct separation of liquids and solids and to meet the requirements of Australian Standard AS5008:2007



## Pre-Heater / Cooker

The ground raw materials are heated in large vessels that also agitate the material to ensure uniform cooking which will cause the liquids to separate from the solids.



## Press

After passing the cooked materials over a screen to drain away the free liquids the cooked solids are pressed to squeeze out any remaining liquids.



## Horizontal Decanter

The drained liquids are passed through a horizontal centrifuge which separates any solids which may have passed through the screen and the liquid.



## Separator / Polisher

The tallow is processed through a high speed centrifuge to remove any remaining protein and water.

This is to ensure it meets the specification for insoluble impurities and moisture of 0.15%w/w.



## On Plant Tallow Storage

Tallow is stored in insulated tanks which have steam coils to heat the tallow to liquefy it for pumping into the tanker.

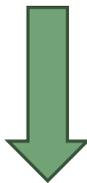


## Hammermill

The dried crax are passed through a hammermill then are screened to ensure they meet specification for sizing. Over size pieces are returned to the mill.

Meal is then sent to storage bins.

# Tallow



Biodiesel



©Real Food Renegade

Soap and Cosmetics



Edible Shortenings  
and Frying Fats

# Tallow Specifications



Grades	TITRE °C min	FFA % max	FAC max	R&B	MIU % max
Edible	41	0.75	5	0.2	0.5
Top white	41	1	5	0.3	1
Pure Beef	41.5	1.5	11A	0.4	1
Good Soap	41.5	2.5	11B	0.5	1
Prime	42	2	17	0.5	1
Bleachable Fancy	40	4	21	1.5	1
Yellow Grease	25-37	15	7	n.s.	2.0
Feed Grade	40	15	37	n.s.	2.0

# Tests for Fats and Oils



- \* **Titre** is the solidification point of the component fatty acids in degrees Celsius. A general classification for traded fats and oils, titre is related to physical hardness. Standard test method AOCS Cc 12-59.
- \* **FFA** is Free Fatty Acid and is the percentage of titrable acid measured with standardised sodium hydroxide solution. These acids arise from hydrolysis of fats and oils. For tallow, they are reported as oleic acid. Standard test method AOCS Ca 5a-40.
- \* **FAC** is a colour set for matching typical American fats. FAC is not a uniform or linear scale. Standard test method AOCS Cc 13a-43.
- \* **Lovibond** colour is an international, rational colour scale based on standard red and yellow units for comparison of fats and oils colour. Lovibond AOCS “(Wesson”) or BSI (U.K.) colour standards may be used. Automatic instruments may be used. Standard test method AOCS Cc 13b-45.



- \* **R&B** colour is colour after refining and bleaching and is expressed in terms of Red on a 5.25” (133mm) cell according to AOCS Cc8d-55.
- \* **IV** is the Iodine Value and may be determined by Gas Chromatography composition analysis or by titration methods. The IV provides the level of unsaturation. More saturated fats have lower values and are harder (higher slip melting points). Standard test method used is AOCS Cd 1d-92.
- \* **MIU** is the total of results for moisture, insoluble impurities and unsaponifiable matter.
- \* **PV** is the Peroxide Value and is a common way of assessing fat rancidity primarily caused by oxidization. Standard test method AOCS Cd 8b-90.
- \* **SV** is the Saponification Value and is an estimate of the mean molecular weight of the constituent fatty acids in a fat sample. Standard test method AOCS Cd 3-25.

# Meals



Meat and Bone Meal  
Blood Meal



Petfood



Pigs



Aquaculture



Chickens

# Protein Meals



- \* Animal protein meals are produced from the solid material remaining after being separated and sterilised from the fat portion of animal tissues. The solid material is dried and then finely ground to produce free flowing meal.
- \* Rendered animal protein meals are moderate to rich sources of protein, amino acids, energy, calcium, Phosphorus, essential fatty acids and other vital nutrients.
- \* These materials contain restricted animal material and may not be fed to cattle, sheep, goats, deer and other ruminants but may be fed to monogastric animals such as pigs, poultry, dogs and cats and in aquaculture diets for some fish and prawns.

# Tests for Protein Meals



- \* **Protein:** Meat and bone meals are sold on protein content. While the majority are sold as 50% protein, meals can be sold containing other protein levels. Standard test method AOAC 990.03 Dumas.
- \* **Fat:** The fat content of meat and bone meal is the residual fat left in the product after centrifuging and pressing and usually averages 8 to 12 per cent. Standard test method AOAC 920.39.
- \* **Moisture:** The moisture content in meat and bone meal is the residual water after the raw material has been dried and it usually varies between 5 and 8 percent. Moisture content of meal is critical to meal quality. Standard test method AOAC 934.01.
- \* **Fibre:** Fibre is the relatively insoluble carbohydrate, such as cellulose and is due to remnants of vegetable material in the rendered offal. Standard test method AOAC 962.09.
- \* **Ash:** Ash is the percentage of residue (mineral matter) remaining after combustion at 600°C for two hours and reflects the ratio of bone to soft tissue in the raw material. Standard test method AOAC 942.05.



- \* **Salmonella:** Salmonella are non-spore forming micro-organisms readily destroyed by the rendering process. However post-process contamination during handling, storage and transport can still occur just as it does with any feed ingredient. ARA accredited establishments abide by a code of practice to minimise post production contamination. Standard test method AOAC 989.13/966.08.
- \* **E. Coli:** E. Coli are non-spore forming micro-organisms readily destroyed by the rendering process. However post-process contamination during handling, storage and transport can still occur just as it does with any feed ingredient. ARA accredited establishments abide by a code of practice to minimise post production contamination. Standard test method AOAC 991.14.
- \* **Clostridium Perfringins:** Clostridium Perfringins are spore forming micro-organisms and are the micro-organism used in the Australian Standard to determine the ability of the rendering process to destroy spore forming bacteria of concern. The tests are conducted on an annual basis at the plant level to validate the effectiveness of the rendering process. Standard test method AS1766.2.8



- \* **Pepsin Digestibility:** This is the percentage of feedstuff taken into the digestive tract that is absorbed into the body. Standard test method AOAC 971.09.
- \* **Calcium/Phosphorus:** The high Phosphorus availability of MBM is one of its major nutritional advantages over vegetable proteins. Standard test method AOAC 935.13/965.17 15th.
- \* **Mesh Screen Test:** This test is to determine whether the material has been satisfactorily ground following drying. Standard test method 98% of the MBM should pass through a 2.00mm (US #10) mesh screen and 100% should pass through a 5.00mm mesh screen.