

Animal Proteins from Human Food to Animal Feed

RETASTE conference 28.9.2023



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Topics of presentation



- Pathway from food to animal feed
- ABPs categories and uses
- Legislation in animal feeding
- Feed materials of animal origin
- PAPs and former food in animal feeding
- Prohibitions and feed ban
- Permitted feed materials per animal species

Definitions...

Product of animal origin



Food Waste

Animal by-product/
former food



processing,
rendering

Feed material
of animal origin



Food, any substance or product, whether processed, partially processed or unprocessed, intended to be, or reasonably expected to be ingested by humans (R.178/2002, article 2)

Product of animal origin (PAO)

food of animal origin, consist of or contain meat, milk, eggs, fish, honey and blood (R.853/2004, Annex I, point 8.1)

Food waste, food that is discarded (v.4819/2021, άρθρο 3.4^α)

Animal by-products: entire bodies or parts of animals, products of animal origin or other products obtained from animals, which are not intended for human consumption (R.1069/2009, article 3.1)

Derived Product (DP)

products obtained from one or more treatments, transformations or steps of processing of animal by-products (R.1069/2009, article 3.2)

Former food: products of animal origin, which are no longer intended for human consumption for commercial reasons (R.1069/2009, article 10f)

Feed, any substance or product, including additives, whether processed, partially processed or unprocessed, intended to be used for oral feeding to animals (R.178/2002, article 3.4)

Feed materials of animal origin are fresh or preserved, satisfy the nutritional needs of animals and are used directly or after processing or in the preparation of compound feed. (R.767/2009, article 3.2g)

ABPs categories and uses

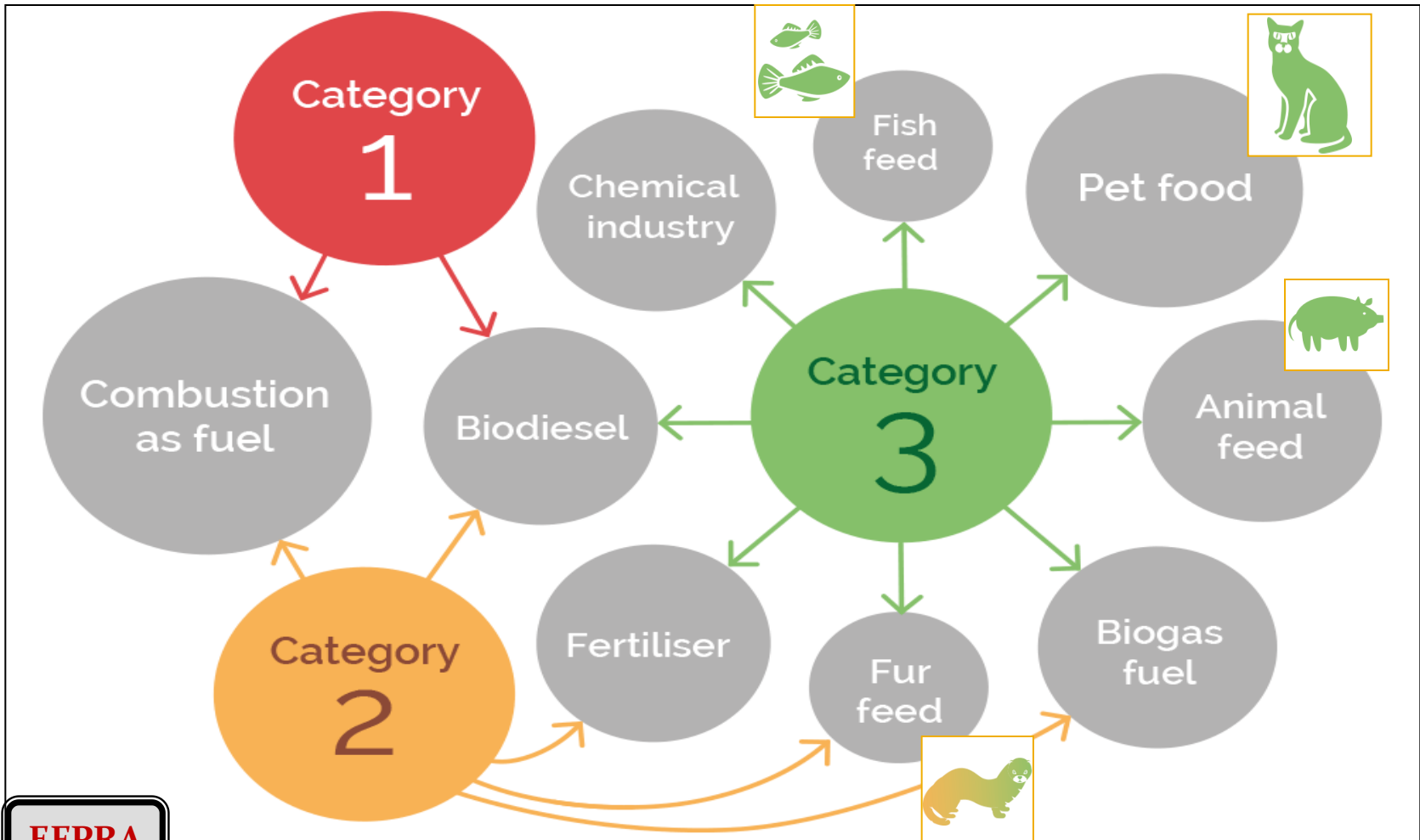


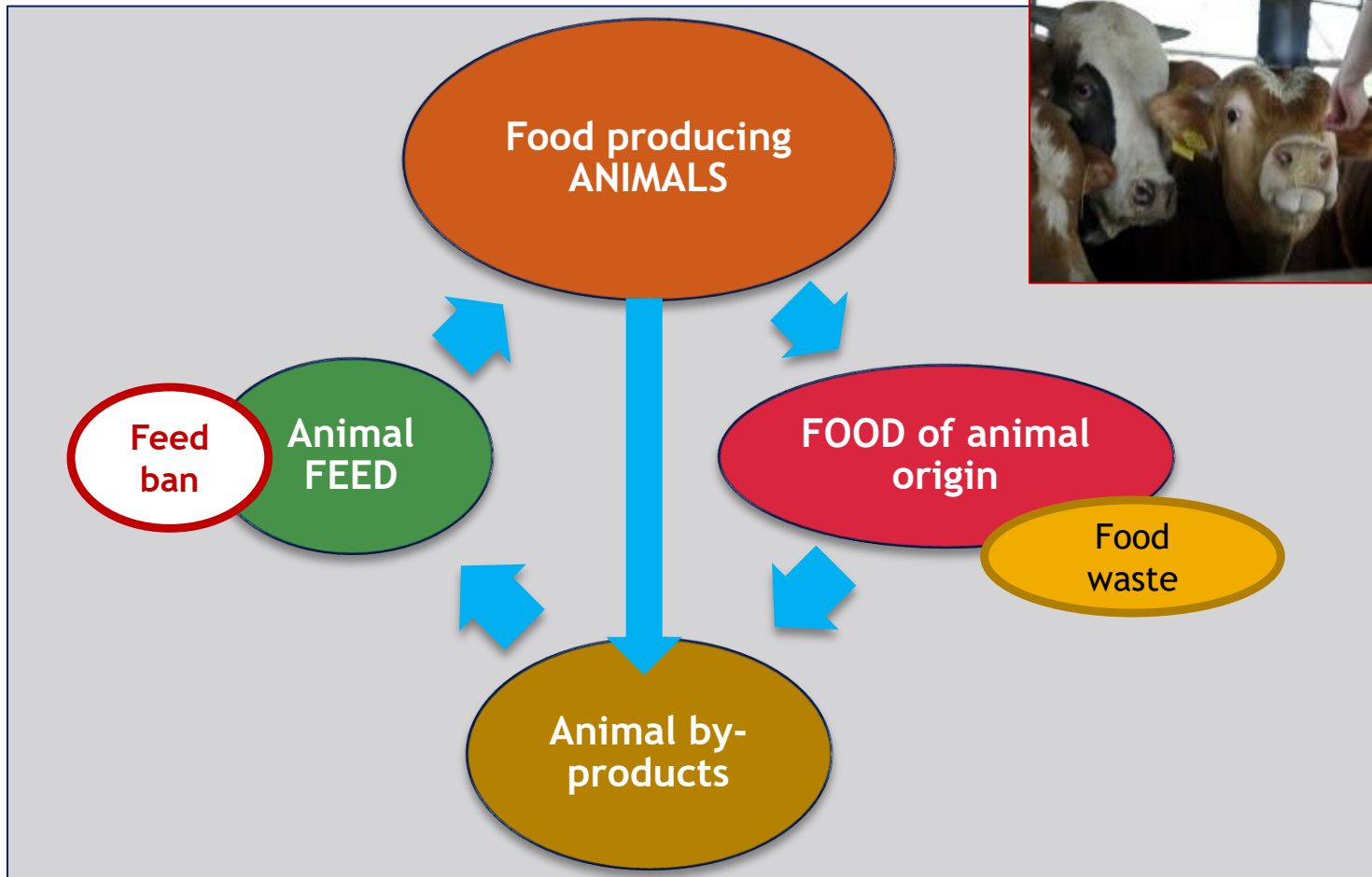
Figure 2. Food waste hierarchy obtained from WRAP (2018).



The use of former foodstuffs/by-products to produce animal feed is very high in the food use hierarchy

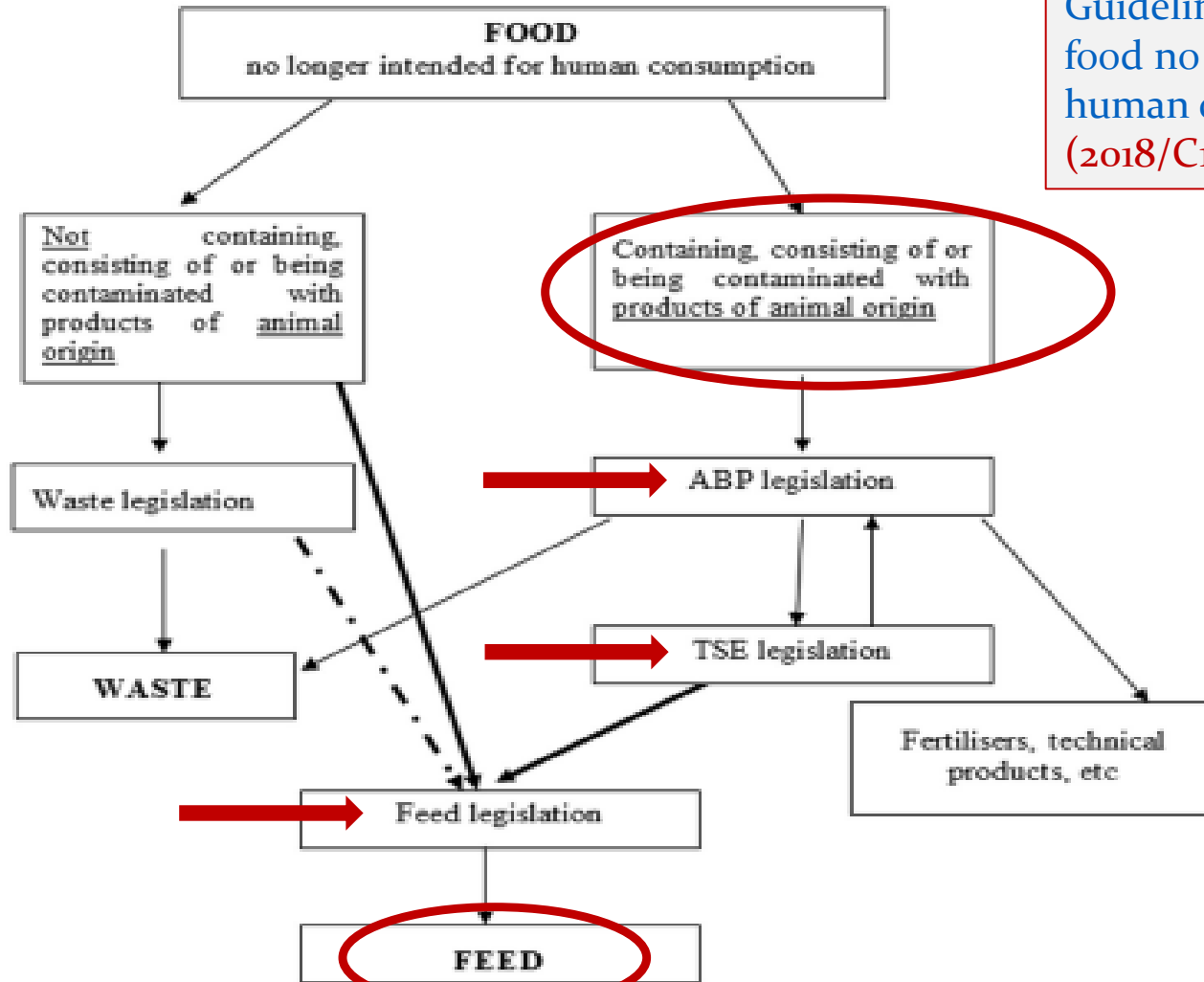
FOOD to FEED

Sustainability is important, but safety is a prerequisite!



Flow chart from food to feed

Commission Notice —
Guidelines for the feed use of
food no longer intended for
human consumption
(2018/C133/02)



Legislation in animal feeding

Food Waste
(Directive 2008/98)

FOOD Regulations

- Reg(EC) 178/2002 – General Food Law
- Reg(EC) 852/2004 – Food Hygiene
- Reg(EC) 853/2004 – Food Hygiene

ABP/TSE* Regulations

- ABP Reg(EC) 1069/2009
- ABP Reg(EC) 142/2011
- TSE Reg(EC) 999/2001

FEED Regulations

- Reg(EC) 183/2005 – Feed Hygiene
- Reg(EC) 767/2009 – Feed Marketing
- Reg(EC) 68/2013 – Feed materials catalogue

Commission Notice (2018/C 133/02)

Guidelines for the feed use of food no longer intended for human consumption

*ABP: Animal By-Products
*TSE: Transmissible Spongiform Encephalopathies

Feed materials of animal origin

Materials of animal origin that satisfy the nutritional needs of animals and are used directly or for the preparation of compound feed (*R.142/2011, Annex I.3*). Feed materials of animal are **ONLY category 3 materials** and produced in food plant (processed according to article 2(1)(m) of R.852/2004) or in ABP processing plant cat.3 and include:

- **processed animal proteins - PAP** (including blood-meal and fish-meal)
- rendered fat, fish oil, fat derivatives
- blood products
- gelatin, collagen, hydrolyzed proteins
- di-calcium phosphate, tri-calcium phosphate
- **former processed food** (milk, eggs, honey and their products)

Only DPs
category 3



PAP definitions

Processed animal protein -PAP (R.142/2011, Annex I.5)

animal protein derived entirely from **Category 3** material, which have been heat treated, including blood meal and fishmeal. (*PAP does not include blood products, milk, milk-based products, milk-derived products, colostrum, colostrum products, centrifuge or separator sludge, gelatine, hydrolysed proteins and dicalcium phosphate, eggs and egg-products, including eggshells, tricalcium phosphate and collagen*)

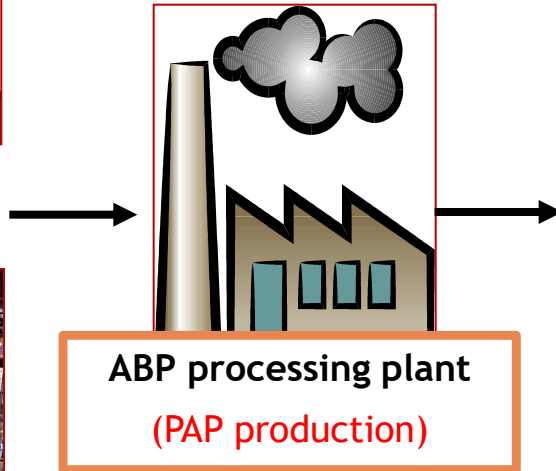
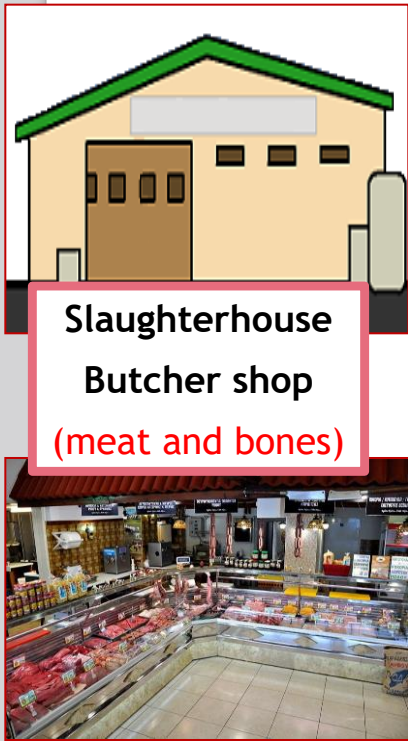
fishmeal (R.142/2011, Annex I.7) processed animal protein derived from aquatic animals except sea mammals

blood meal (R.142/2011, Annex I.6) processed animal protein derived from the **heat treatment of blood** or fractions of blood

Blood products are the derived products from blood such as dried/frozen/liquid plasma, dried whole blood, dried/frozen/liquid red cells or fractions thereof and mixtures (R.142/2011, Annex I, point 4).



PAP from food to feed: Flow chart and legislation requirements



ABP/TSE legislation requirements

Feed/TSE legislation requirements

ABP processing plant cat.3 (rendering plant)

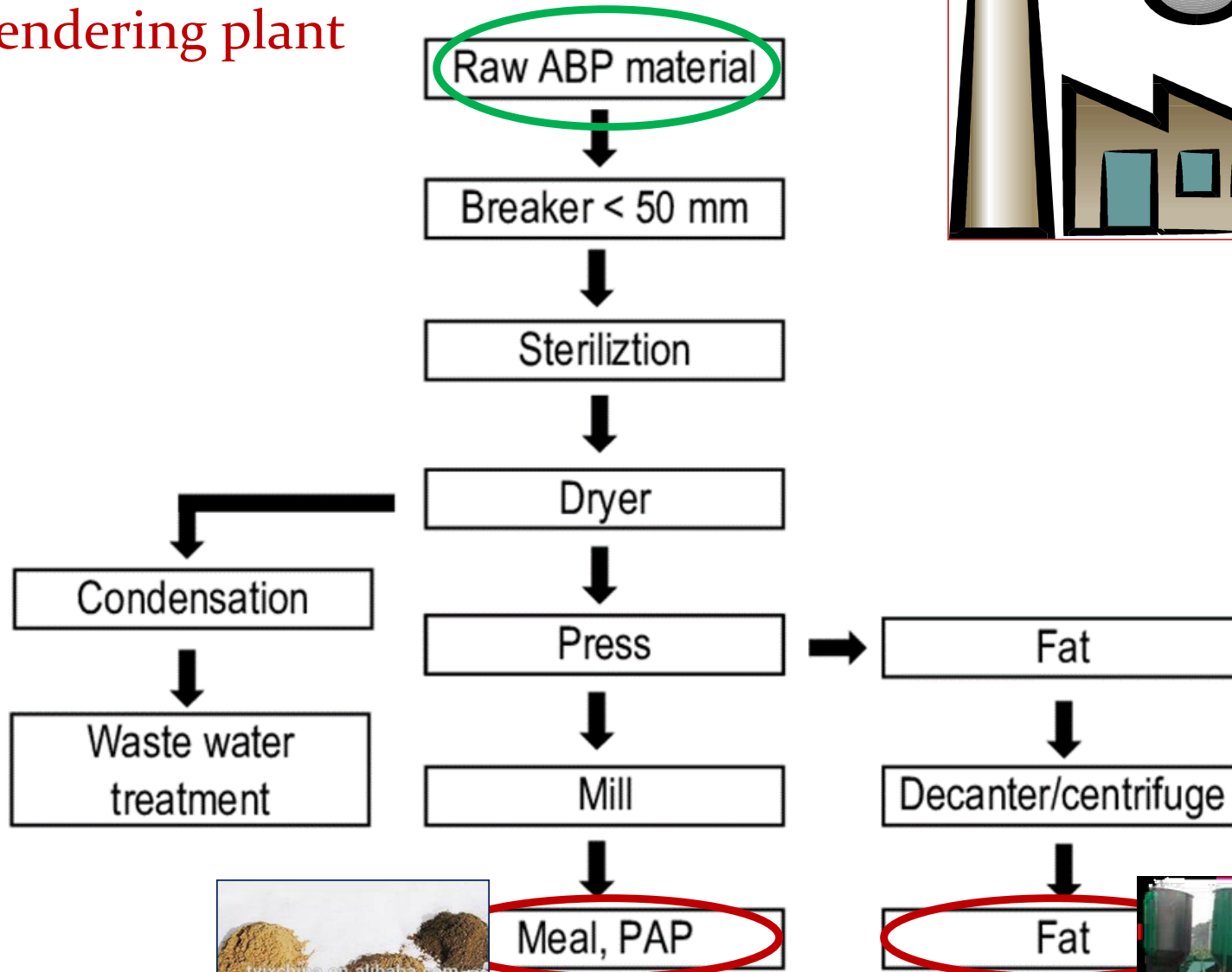
R.142/2011
Annex IV

Conversion of organic substances (ABPs) in
PAP and rendered fats



- 3
- Best available technology for the utilization of ABPs as feed
 - Only raw materials category 3
 - Processed products (PAP, rendered fats)
 - Rendering plant needs approval **for specific category and animal species** (e.g. M3 from poultry) from the competent veterinary authorities

Flow chart for PAP production in a rendering plant



Critical parameters in PAP production



- Pulping of the incoming raw material

SOS

Processing method 1 (pressure sterilization)

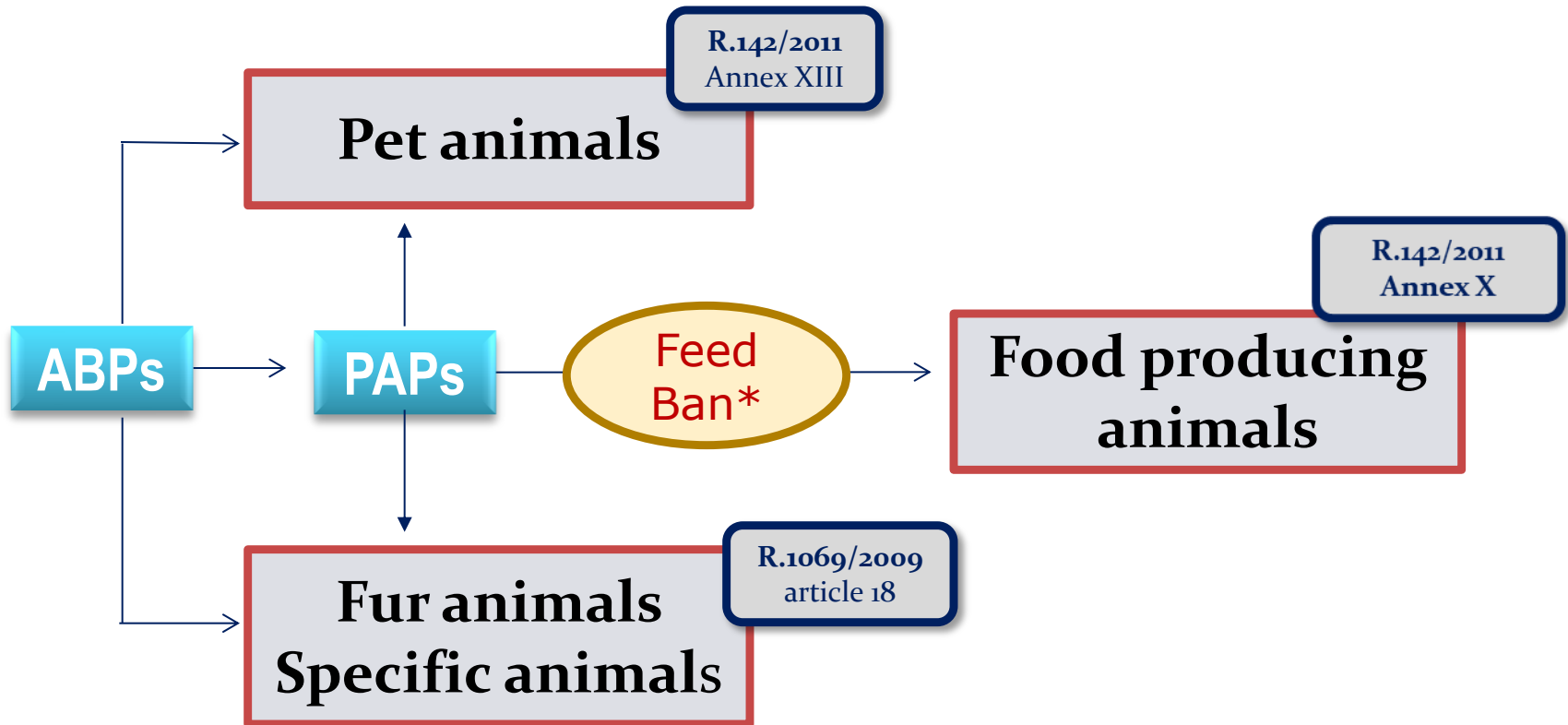
- Particles size < 50mm
- Temperature 133°C for 20'
- Pressure 3 bar



- **Rendering cooker**



Animal species and feedban



* Feed ban of 2001 following the BSE crisis

Prohibitions concerning animal feeding

Prohibited materials for animal nutritional purposes (*such as faeces, urine, tanned hides, wood, waste water, household waste, packaging*)

R.767/2009
article 6
Annex III

The following uses of ABPs/DPs are prohibited:

- (a) the feeding of terrestrial animals with **PAP** derived from **the same species**
- (b) the feeding of farmed animals with **catering waste**
- (c) the feeding of farmed animals with herbage from land to which organic fertilisers or soil improvers, other than manure, have been applied unless the cutting or grazing takes place after at least **21 days**
- (d) the feeding of farmed fish with **PAP** derived from farmed fish **of the same species**

R.1069/2009
article 11

Feed ban regulation

R.999/2001
article 7
Annex IV

- ✓ The feeding to ruminants of protein derived from animals is prohibited.
- ✓ The feeding to non ruminants of protein derived from animals is restricted*, in accordance with Annex IV.

* Any changes to current bans need to be preceded by risk assessments by the EFSA to ensure that risks for the food chain are negligible

Progress on feed use

2013 (*Regulation 56/2013*)

- Re-authorization of **non-ruminant PAPs** in fish feed

2017 (*Regulation 2017/893*)

- Authorization of **insect PAPs** in fish feed

2021 (*Regulation 2021/1372*)

- Authorization of **pig and insect PAPs** in poultry feed
- Authorization of **poultry and insect PAPs** in pig feed
- **Gelatine and collagen** of ruminant origin in the feed of non-ruminant

PAP from ruminants in animal feeding

Processed animal protein derived from ruminants (bovine, sheep and goats), including blood meal, **is banned** in the feed of farmed animals, due to BSE crisis.



R.142/2011, Annex X
R.999/2001, article 7

Processed animal protein derived from ruminants:

- must be produced in approved processing plants, with any of processing methods 1 to 5 or processing method 7
- intended to be used **for feeding pet animals and fur animals**

PAP from non-ruminants in animal feeding

PAP derived from	PAP as feed of the following animals
PAP from non-ruminants	Aquaculture (2013), pet and fur animals
Fishmeal	Aquaculture, only un-weaned ruminants , non-ruminants, pet and fur animals
PAP only from porcine	Aquaculture (2013), poultry (2021), pet and fur animals
PAP only from poultry	Aquaculture (2013), porcine (2021), pet and fur animals
PAP only from insects	Aquaculture (2017), poultry (2021), porcine (2021), pet and fur animals



R.142/2011, Annex X
R.999/2001, Annex IV

Processed animal protein derived from non-ruminants:

- must be produced in approved processing plants, with
 - processing **method 1** for food produced animals
 - any of processing **methods 1 to 5 or 7** for pet animals and fur animals

PAP from insects in animal feeding

Processed animal protein derived from farmed insects, may only be obtained from the following insect species:

- Black Soldier Fly (*Hermetia illucens*)
- Common Housefly (*Musca domestica*)
- Yellow Mealworm (*Tenebrio molitor*)
- Lesser Mealworm (*Alphitobius diaperinus*)
- House cricket (*Acheta domesticus*)
- Banded cricket (*Gryllodes sigillatus*)
- Field Cricket (*Gryllus assimilis*)
- Silkworm (*Bombyx mori*)

R.142/2011
Annex X



R.999/2001
Annex IV

Processed animal protein derived from farmed insects:

- must be produced in approved processing plants, with any of processing methods 1 to 5 or processing method 7
- intended to be used for feeding aquaculture animals (R.2017/893), poultry and porcine animals (R.1372/2021)

Former food used in animal feeding

Former food	Requirements	Food producing animals				Pet and fur animals
		Ruminants	Pigs	Poultry	Aquaculture	
<ul style="list-style-type: none"> Milk and products Eggs and products Honey Rendered fats (R<0.15%) Collagen/gelatin¹ 	<ul style="list-style-type: none"> Originated from EU Processed under food hygiene legislation 	¹ only from nR				
<ul style="list-style-type: none"> Fish Fishery products 	<ul style="list-style-type: none"> Processed as fishmeal (PAP)² 	² only for unweaned R in milk replacers			² no cannibalism	
<ul style="list-style-type: none"> Meat of nR Meat products of nR 	<ul style="list-style-type: none"> Processed as PAP³ 		³ only PAP from poultry & insects	³ only PAP from pigs & insects		
<ul style="list-style-type: none"> Meat of R Meat products of R 						

(R) Ruminants

(nR) non-Ruminants

(PAP) processed animal protein

Feed materials per animal species

	Product types	Farmed animals other than fur animals					Pet and fur animals
		Ruminants	Porcine animals	Poultry	Other non-ruminants	Aquaculture animals	
1	Ruminant processed animal proteins (PAP) including blood meal						
2	PAP from porcine animals			2021		2013	
3	Other non-ruminant mammalian PAP					2013	
4	PAP from poultry		2021			2013	
5	PAP from farmed insects		2021	2021		2017	
6	Fishmeal (PAP) (includes blood meal of aquatic animals)	In milk replacers for unweaned Ru-s only				No fishmeal of farmed species X to same species X	
7	Blood products from non-ruminants						
8	Blood products from ruminants						
9	Hydrolysed proteins from non-ruminants and/or ruminants hides and skins						
10	Hydrolysed proteins other than those only derived from non-ruminants and/or ruminants hides and skins						
11	Gelatine and collagen from ruminants		2021	2021	2021	2021	
12	Gelatine and collagen from non-ruminants						
13	Di and tricalcium phosphate of animal origin						
14	Egg, egg products, milk, milk products and colostrum						
15	Animal proteins other than the above-mentioned ones						
	Colour codes	Not authorized		Authorized		Authorized for certain types of animals	

*fishing bait is considered to fall under the category of feed for aquaculture, since one cannot guarantee that the fishing bait is only used for wild aquatic animals and not for kept aquatic animals.

Thank you for your attention!



<http://www.minagric.gr/index.php/el/for-farmer-2/animal-production/zoikaypoproionta>
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