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DDGS

Module: Dried Distiller Grains, with solubles
HS Code: 2303 3000
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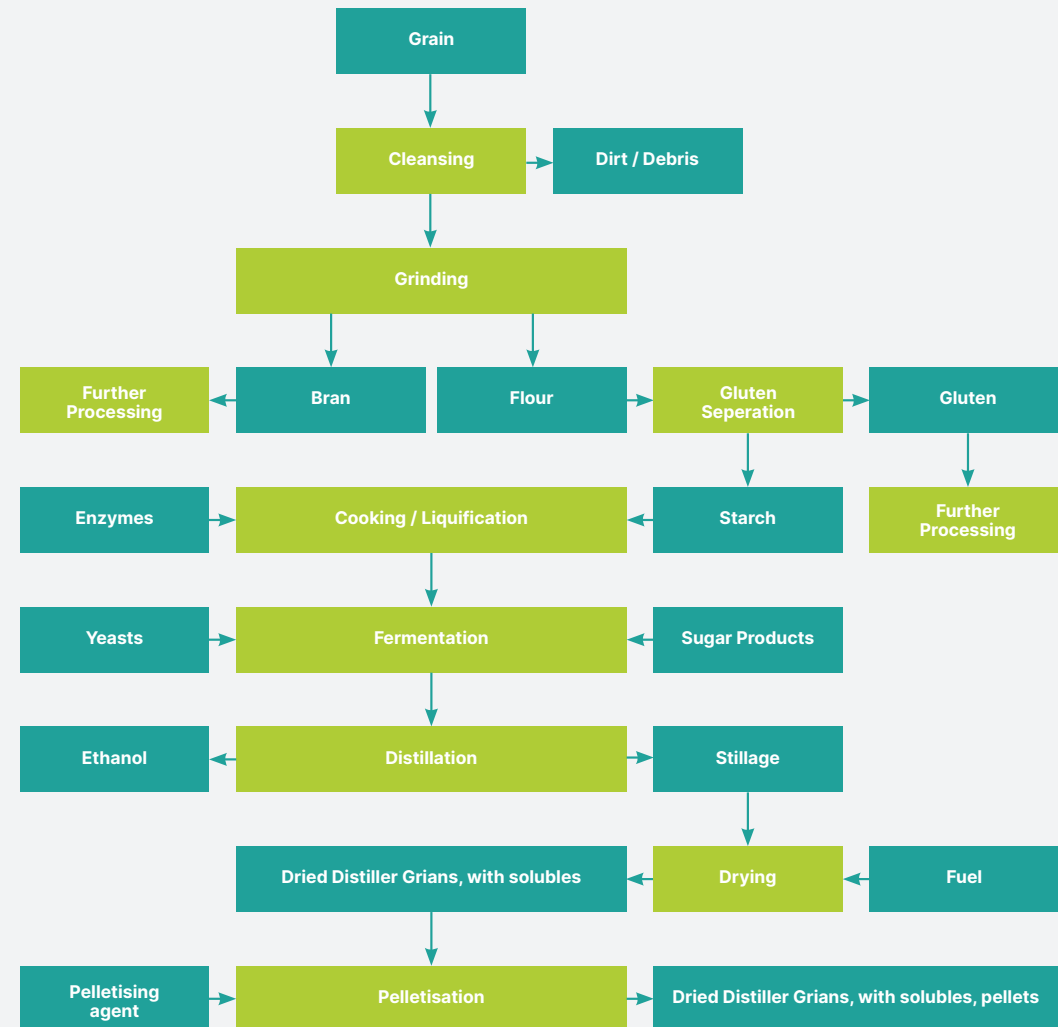
02 PRINCIPLE PROCESS

On the right side, a typical processing line of the ethanol extraction from grain has been visualised. At the beginning of the process, the grain is cleaned thoroughly to remove dirt and other large debris, after which it's being grinded. By means of this grinding process, the Bran is separated from the flour, after which both are processed further.

After the bran has been removed, gluten is isolated from the flour, to be used for further applications. The starch- and protein rich flour remaining is being cooked, before being liquified, having enzymes added to further prepare the product. After the cooking and liquification process, sugar products (e.g. syrup) and yeasts are added, initiating the fermentation process.

After the fermentation process is completed, the ethanol is extracted from the intermediary product by means of distillation. The product that remains after this distillation, the *stillage* is then dried using a natural gas heated drum dryer, leaving the *Dried Distiller Grains with solubles*.

Whereas the Dried Distiller grains are being stored and traded as such, the product generally receives an additional treatment, by means of which so-called pelletising agents are added to the product, in order to form the product into pellets that are suitable to be used as a feed material, while at the same time increasing the handling characteristics.



03 APPLICATION

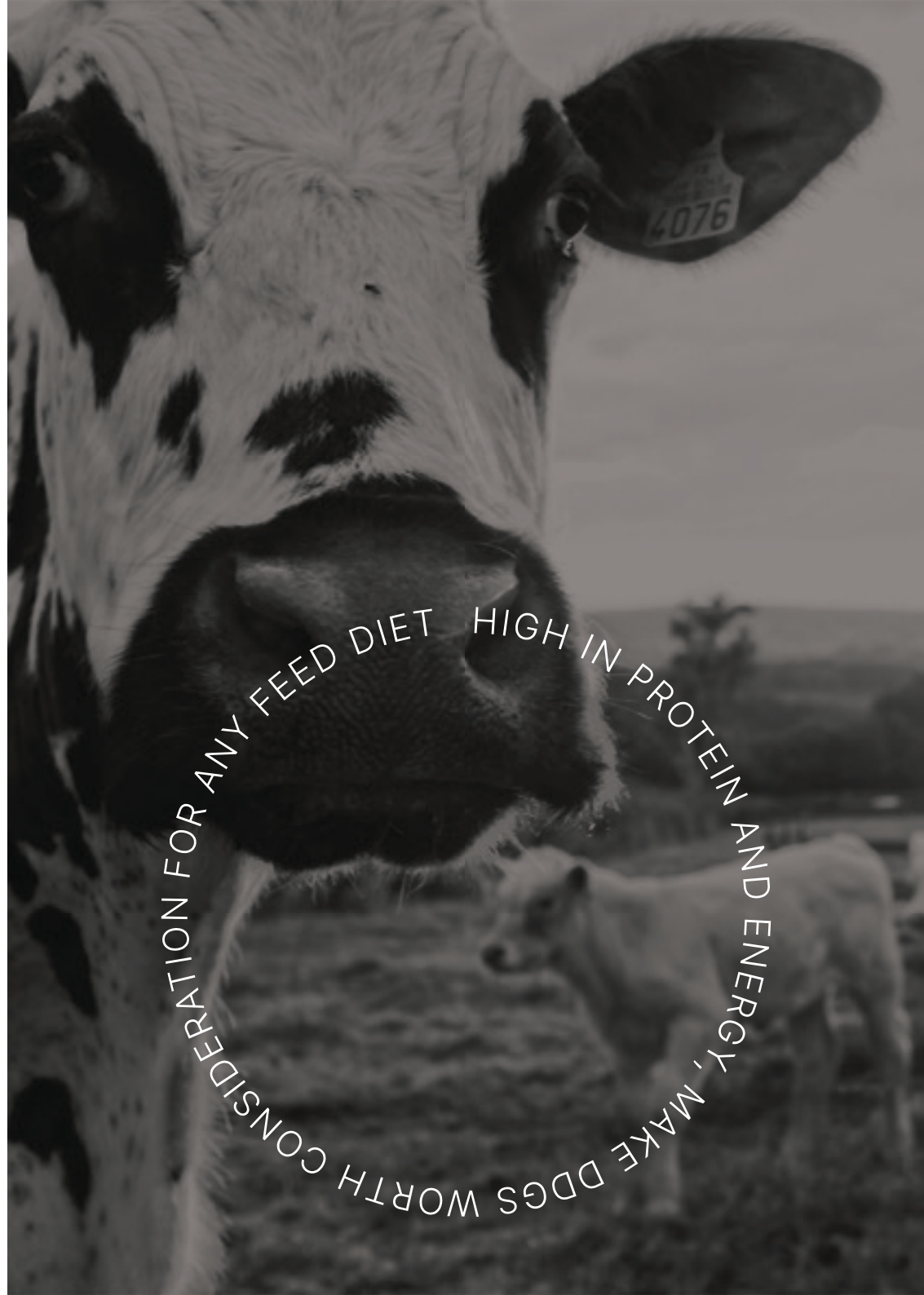
Dried Distiller Grains, with Solubles (DDGS) are used as a protein and energy component for **direct feeding** or included as an **ingredient in compound feed**. Due to its high protein content, excellent palatability and high energy value, inclusion of DDGS in the ration suffices as a stand-alone aspect, **covering both the energy and protein requisite in the diet**, for ruminants, while supporting milk production.

Other than alternative protein sources and grains, the unique proposition of the DDGS, in which the energy is predominantly provided as **readily digestible fibre and fat**, limits the chance and severity of rumen acidification. Residual yeast fragments, remaining in the product as part of the processing, aid in the further conversion and digestion of feed within the rumen. Maximum recommended inclusion rates range from abt. 20 percent for calves to 20 percent in dairy cow rations and 30 percent in beef cattle. Inclusion in diets suitable for lambs and ewes are generally comparable, with a maximum recommended inclusion of 5 and 20 percent, respectively.

As for ruminants, DDGS are an excellent source of energy and protein, while **supporting high levels of overall feed intake due to the palatability of the product**. Maximum inclusion rates for the product range from 20 to 25 percent for pig- and sow diets.

Inclusion of DDGS has a beneficial effect on the overall feed intake in poultry, while at the same time providing great protein content as well as a high fat level, making the product a well-valued supplement providing a **high level of metabolizable energy and enhancing growth**. At the same time, the residual xanthophyll present in the product is favorable for the yellow colour of egg yolks, **improving egg quality**. The recommended inclusion in broiler diets is 20 percent, whereas for layers, the inclusion rate is suggested at a maximum of 15 percent.

Feed products with a basis of DDGS are **very high in protein and energy**. Therefore, they are considered a multi-applicable source of nutrition, excellently suitable to be used in ruminant- and monogastric rations.



CONSIDERATION FOR ANY FEED DIET HIGH IN PROTEIN AND ENERGY, MAKE DDGS WORTH

04 NUTRITIONAL VALUE

- Dried Distiller Grains, with solubles, have the following specific characteristics:
- Very high protein content
 - High energy value, in readily digestible fibre and fat
 - Less risk on rumen acidification compared to feeding of other protein sources
 - Increased overall rumen conversion rate due to present yeasts
 - Great palatability, having a significantly positive impact on feed consumption
 - Positively influences egg yolk colour and egg quality

Altogether, Dried Distiller Grains, with solubles, are a highly valuable, multi-applicable component in any feed diet. Besides the stand-out levels on protein and energy, the secondary particulars of the product provide great opportunity and are worth consideration for either a ruminant- or monogastric diet.

Despite the broadly applicable spectrum on the nutritional side of the product, of which indicative values are displayed on the right side, the trading specifications, based on which Dried Distiller Grains, with solubles, Pellets are contracted are generally classified in line with below:

- **Profat** min. 35,0%
- **Fibre** max. 12,5%

Dried Distiller Grains, with solubles		
Generic Analysis		
Dry Matter	90,00	%
Crude Ash	4,20	%
Crude Protein	28,20	%
Crude Fat	13,80	%
Crude Fibre	6,85	%
Starch	9,00	%
Sugars	3,50	%
Calcium	1,60	g/kg
Magnesium	3,30	g/kg
Phosphorums	7,90	g/kg
Potassium	10,30	g/kg
Sodium	2,40	g/kg
Iron	0,12	g/kg
Amino Acids (in % of protein)		
Alanine	7,10	%
Arginine	4,30	%
Aspartic Acid	6,80	%
Cystine	2,00	%
Glutamic Acid	15,90	%
Glycine	4,00	%
Histidine	2,70	%
Isoleucine	3,80	%
Leucine	11,60	%
Lysine	3,00	%
Methionine	2,00	%
Phenylanine	4,80	%
Proline	7,70	%
Serine	4,70	%
Threonine	3,70	%
Tryptophan	0,80	%
Tyrosine	3,90	%
Valine	5,10	%