Agenda

- Cargill GOSCE
- OilSeeds
  - Origin
  - Uses for the Oilseeds
- Uses for the Oilseeds Oil
- Uses for the Oilseeds Meal
- Food / Feedsafety
Cargill GOSCE

- Operate in 18 countries in Western, Central & Eastern Europe
- Operate 19 crushing plants
- Operate 6 port facilities
- Operate 49 inland silos
- Sell from 4 biodiesel plants
- Trade grain & feed ingredients
- Employ around 3,600 people
Countries
Cargill GOSCE focuses on the six major Grains & Oilseeds

**OILSEEDS**
- Sunflower Seed
- Rape Seed (Canola)
- Soya Bean

**GRAINS**
- Wheat
- Maize (Corn)
- Barley
Countries of origin Oilseeds

OILSEEDS

Sunflower Seed

Rape Seed (Canola)

Soya Beans
Uses for Oilseeds

<table>
<thead>
<tr>
<th>FEED</th>
<th>FOOD</th>
<th>Technical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish</td>
<td>Chicken</td>
<td>Man</td>
</tr>
<tr>
<td>Cow</td>
<td>Dog</td>
<td>Tool</td>
</tr>
<tr>
<td>Pig</td>
<td>Bone</td>
<td>Square</td>
</tr>
</tbody>
</table>
Can you name products made from / with Oilseeds?

<table>
<thead>
<tr>
<th>FOOD</th>
<th>TECHNICAL</th>
<th>FEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooking oil/</td>
<td>Biodiesel</td>
<td>Compound Feed (pigs/cows/chicken)</td>
</tr>
<tr>
<td>Frying oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Margarines</td>
<td>PVC (plastics)</td>
<td>Fish feed</td>
</tr>
<tr>
<td>Lecithin</td>
<td>Lubricants</td>
<td>Fermentation basis</td>
</tr>
</tbody>
</table>
Uses for Oilseeds

Can you name products made from / with Oilseeds?

Did you think this?
Uses for Oilseeds

Oilseeds are processed for production of FOOD products
Uses of Oilseed Oil

Soy Oil
- 80% Food
- 20% Biodiesel

Rape and Sun Oil
- 58% Oil
- 42% Meal (*)

- Split use of vegetable oil in the EU (2011) Source: FEDIOL statistics

MVO - de ketenorganisatie voor oliën en vetten
Main use Seed Oils in Feed Stuffs

<table>
<thead>
<tr>
<th>Crude Rapeseed Oil</th>
<th>Aqua feed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Sunflower Oil</td>
<td>Poultry feed</td>
</tr>
<tr>
<td>Crude soybean oil</td>
<td>Poultry feed</td>
</tr>
</tbody>
</table>
Uses of Oilseed Meal

Soy Meal
- 80% Meal (*)
- 20% Oil

Rape and Sun Meal
- 58% Meal (*)
- 42% Oil

>80% FEED
Feed safety

10 Kg of Feed results in:

- 1kg Beef
- 3kg Pork
- 5kg Chicken
- 9kg Insects
Sources of Protein in Feeding

Oilseed meals are the main source of protein in feedstuffs

Source: Fevac.eu
Food safety of Oilseeds/products
## Most important hazards Oilseeds

<table>
<thead>
<tr>
<th>RISK</th>
<th>OIL</th>
<th>MEAL</th>
<th>By Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pesticides</td>
<td>X (crude)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>PAH4/BaP</td>
<td>X (refined)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Bacteria (salmonella)</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Dioxins / PCB’s</td>
<td>If coconut</td>
<td></td>
<td>Coconut and FAD</td>
</tr>
<tr>
<td>Mineral Oil</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>GMO</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

=> In depth incoming raw material risk assessment is advised, combined with good process knowledge, in order to assure food/feed safe products.
Cargill Risk Assessment Sources

- Regulatory & Scientific Affairs
- Field representatives
- Seed Manufacturers
- Suppliers & Trade Associations
- Chemical manufacturers
- Monitoring data
- Cargill Crop Analysts
- Historical Data
- Cargill Agriculture Input Business
- Research projects

=> raw material material risk assessment
Adjustment of Combine Harvester

Previous crop
Tillage
Cultivar (seeds)

Fungicides

Field

Storage - Elevators

+ if MAIZE - if WHEAT or OILSEEDS
+ if NO TILLAGE - if TILLAGE

VARIETIES - or + SENSITIVE
Use of fungicide at right time minimize mycotoxins spread

more dust & admixture = more mycotoxins

CUSTOMERS

FOOD

FEED

+ if NO TILLAGE
- if TILLAGE

02/12/2004

MVO - de ketenorganisatie voor oliën en vetten
Raw material risk assessment based on

- Knowledge such as practices and local requirements in the supply chain
- Data such as monitoring results
- Product characteristics, change in (GMO) varieties
- Climate circumstances (e.g. aflatoxin, wet means drying, etc)
This means:
may vary from year to year

Monitoring:
So in depth monitoring in order to assure correct risk
assessment/country need is done every year at start of crop.
-> you can’t rely on previous year (e.g. aflatoxin in mais, or dioxin in
rapeseed Ukrain)
Pesticides (limits)
# Pesticides Transfer

<table>
<thead>
<tr>
<th>Olie zaad of fruit</th>
<th>Oil %</th>
<th>Transfer factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palm fruit</td>
<td>50-55</td>
<td>2</td>
</tr>
<tr>
<td>Cocos</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Palm kernel</td>
<td>45</td>
<td>2</td>
</tr>
<tr>
<td>Rapeseed</td>
<td>40-45</td>
<td>2,5</td>
</tr>
<tr>
<td>Sunflower</td>
<td>40-45</td>
<td>2,5</td>
</tr>
<tr>
<td>Soy</td>
<td>19</td>
<td>5</td>
</tr>
</tbody>
</table>

- **20% oil**: Soy bean
- **42% oil**: Rape & Sun

- 5x
- +/- 2,5x
Pesticides (limits)

MRL of Chlorpyrifos in oilseeds is 0.05 mg/kg

What is the maximum MRL in the Soy and Rape oil?

- Soy: 0.250 mg/kg
- Rape: 0.125 mg/kg
PAH4

• One of the most common contaminants found in extracted rapeseed, soya and sunflower oils

• PAH4 and BaP contamination usually comes from the exhaust residues of poorly maintained direct heat grain dryers, or dryers using dirty fuels such as heavy fuel oil or diesel

Poorly maintained burners often burn with a yellow flame, showing incomplete oxidation of the fuel and causing additional contaminants in the exhaust gases
Most grain dryers pass the burner exhaust gasses directly through the grains
PAH4

- Maximum levels (GMP+) in crude oils for Feed are 160ug/kg, there is no EU legal limit for PAH4 for feed use.
- PAH4 is normally only a problem in oils only (and by products)
Feed safety Bacteria / Salmonella

• 2300 strains of salmonella have been identified but only a few cause problems in humans
• 40% of food poisoning outbreaks are caused by salmonella

Salmonella is not a problem in oil, but a problem in Meal
Feed safety Bacteria / Salmonella

• Feed limits:

Absent in 25 grams
Dioxins and PCB’s

The source of dioxins:
- Byproducts of PCB production
- Waste incineration
- Formed by burning hydrocarbons and chloride

PCB’s were used in the past as cooling and insulating fluid for industrial transformers and capacitors
Dioxins and PCB’s (Limits)

Dioxins: Feed material from
Action limit: 0,5 ng WHOPCDD/FTEQ/kg
Rejection limit: 0,75 ng WHOPCDD/F-TEQ/kg
Mycotoxines / Natural Poisons

• Moulds and fungi
  Often found in cereal grains, while not toxic themselves, are often able to produce toxic by-products (mycotoxins)

• Naturally occurring poisons
  Found in some weed seeds such as ambrosia, mustard, cotton etc
Mycotoxines / Natural Poisons (Limits)

• Moulds and fungi
  e.g. Aflatoxin
  Limits in Feed: (EU) 574/2011 / 2002/32/EC: 0,02 mg/kg
  GMP+ dairy farmer : 0,005 mg/kg

• Naturally occurring poisons
  Limits: Most of the cases not detectable
Heavy metals

Mercury (Hg), Cadmium (Cd), Lead (Pb), Arsenic (As)

From environmental contamination (field)

Or by admixture e.g. adding soil (adding weight)
Heavy metals (limits)

Feed limits
Hg (0.1 mg/kg),
Cd (1 mg/kg),
Pb (10 mg/kg),
As (2 mg/kg)
Oil, grease and fuel contamination

• Oilseeds are particularly high risk as contaminating oil, grease and fuel will get extracted into the finished oil products

• Mineral oils, greases and fuels could contain dioxins, heavy metals and polychlorinated biphenyls (PCBs) which are all highly carcinogenic

• US uses mineral oils for dust suppression on the soybeans
Oil, grease and fuel contamination (limits)

Ukraine Sun Flower oil:
Sat C10-C56 from external sources
Max 50 mg/kg ((EC)1151/2009)

Other vegetable oils:
Hydrocarbons C10-C40:
400 mg/kg (GMP+)
GMO

- GM varieties of rape, soya, are being increasingly grown throughout the world
- Control of these crops at the farm level is often poor
- Many food products in the EU are sold as containing no GM material
- Most of the soy imported in the EU is GMO
GMO (Limits)

- In Europe the legal limit for approved GM ‘inclusion’ is 0.9% and grains with a level greater than this must be labelled as GM
- 0.01% (or 1 GM grain per 10,000) is presently the limit of detection for today’s technology
Summary

• Oilseeds are used for Feed and Food production
  – Oil mainly for the food and biodiesel
  – Meal mainly for feed
• Biggest part of the Oilseeds are used for Feed production
• Risks for Meal and Oil are different
Questions?