

We use the export quality soya seed for production of dry extruded full fat soya using method high temperature for short time (HTST).The process temperature is 152 to 158 degree centigrade.Nutritional value is protein 38 to 40%,crude fat 18 to 19%,moisture 6 to 7 %,fiber 6.5 to 7 %, energy 4250 kcal,urease activity - 0.01 to 0.08.

\*The use of dry extruded full fat soya is in layer feed, broiler feed, fish feed, dog feed and in all animal feed .In layer feed 1 to 3% suggested and in broiler feed 1 to 10% suggested.

\*In layer to increase egg size egg mass, lower feed consumption, to increase egg production overall health of bird.

\*In broiler to lower feed consumption, fast growth and to improve chicken quality.

## Why extruded full fat soybeans?

- **Cost of production is lower than solvent extracted soybean meal**
- The oil in extruded full fat soybeans is stable and highly digestible
- Extrusion increases amino acid digestibility
- Easier and cheaper method to add oil uniformly in the feed. No need for oil tanks, pumps and fat coating equipment

## Pressure

- **Dry extrusion** : 30 - 40 bars, increases friction and temperature- Sudden release of pressure from 35 – 40 bars as the product leaves the extruder
- **Wet extrusion** : Less pressure
- **Expander cooking** : yes/no
- **Toasting** : No

## Cooking temperature

- **Dry extrusion** : 150 – 160°C – friction
- **Wet extrusion** : 135 – 140°C – steam – less friction
- **Expander** : 100 – 140°C steam – less friction
- **Toasting, solvent extraction**: 100 – 105°C

## High cooking temperature

- Soybeans extruded at Higher Temperature (154°C as compared to 138°C) results in higher Oil Recovery
- Extruding at higher Temperatures (154°C to 155°C) also results in Higher Amino Acid Digestibility of SBM
- Extruding Soybeans at 160°C does not adversely effect the **Amino Acid Digestibility** as compared to Soybeans extruded at 148°C

## Full – fat SBM – Effect of processing on oil Digestibility

### Effect of heat treatment on SBM AA digestibility in poultry

| Amino acid    | Raw flakes | Adeq processed | Over processed |
|---------------|------------|----------------|----------------|
| Threonine     | 54         | 90             | 80             |
| Cystine       | 43         | 84             | 80             |
| Valine        | 51         | 94             | 84             |
| Methionine    | 53         | 93             | 86             |
| Lsoleucine    | 55         | 95             | 86             |
| Leucine       | 60         | 95             | 87             |
| Phenylalanine | 56         | 96             | 88             |
| Histidine     | 43         | 87             | 78             |
| Lysine        | 67         | 92             | 77             |
| Arginine      | 62         | 96             | 81             |
| Tryptophan    | 78         | 91             | 86             |

### in vivo digestibility I cecectomized roosters

For producing soy products for animal feed applications, dry of low moisture extrusion is preferred.

### Importance of energy in soybean meal

- In broiler formulations, SBM is regarded as a source of digestible amino acids
- Quality control procedures focus on protein and amino acids
- With today's high inclusion rate of SBM, SBM energy represents an important component of its economical value
- In full fat SBM, energy value becomes the driving factor for determining its economic value in feed formulation

## Testing for under toasting and over toasting

- Urease activity – pH rise (under toasting)
- Accelerated UA – Soy Chek (under toasting)
- Trypsin inhibitors-TI
- Protein Dispersibility Index (PDI)
- Protein solubility in potassium hydroxide – KOH solubility (under and over toasting)

## Values of TI and pH rise in SBM

| SBM sample | Trypsin inhibitors,<br>MG/G | Delta pH, pH units |
|------------|-----------------------------|--------------------|
| P – 117    | 1.50                        | 0.01               |
| P1(L1)     | 2.40                        | 0.03               |
| P -122     | 2.90                        | 0.07               |
| 1102 MG    | 3.00                        | 0.08               |
| P4 (L8)    | 3.80                        | 0.08               |
| 1009       | 3.80                        | 0.09               |
| 824        | 4.00                        | 0.08               |
| 986        | 4.20                        | 0.09               |
| 1010       | 4.60                        | 0.12               |
| 1101 AQ    | 5.50                        | 0.17               |