

Canola: More than expected !

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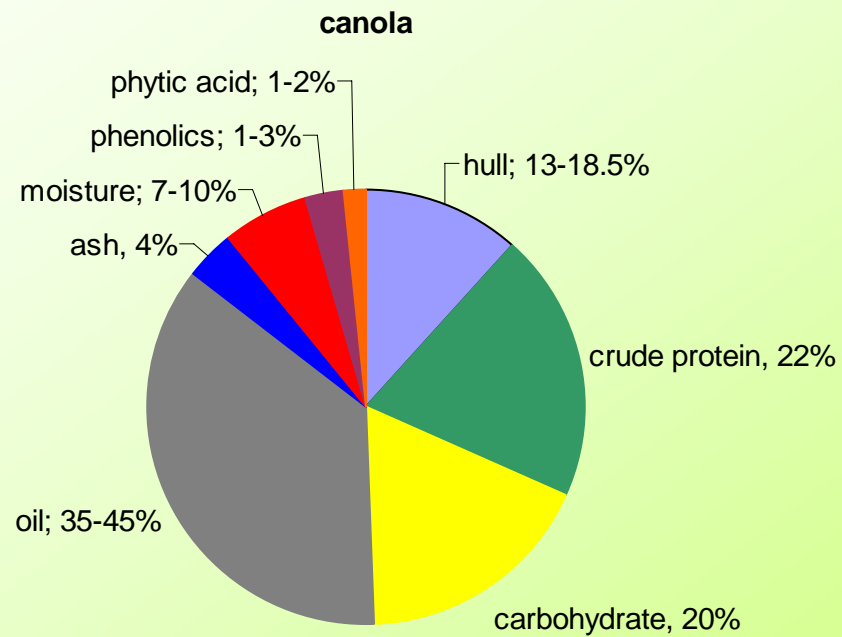
Overview



Recent developments and opportunities

- Canola antioxidants
- Canola proteins
- Phytochemicals of canola
- Health benefits
- Summary

Canola



Canola products



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Canola oil

Edible oil and other non-food use includes biofuels



Canola meal

Animal feed, fertilizers, proteins, other bioactive compounds



Current opportunities for canola oil by-product



Industrial:

new trends in oilseed crushing, processing

Applications:

dietary sources, health issues, food applications and consumer awareness!

Current scenario



- Increasing global canola production
- FDA approval for health claims associated with canola oil and reduced risk of coronary heart disease
- Increasing popularity of edible canola oils; cold pressed and refined oils (ω -3)
- Potential introduction of canola protein for human consumption in the market in near future!
- Optimum use of whole canola with improved quality for healthy food and as functional food
 - example NAPUS 2000

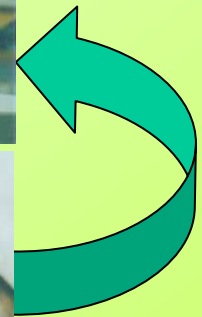
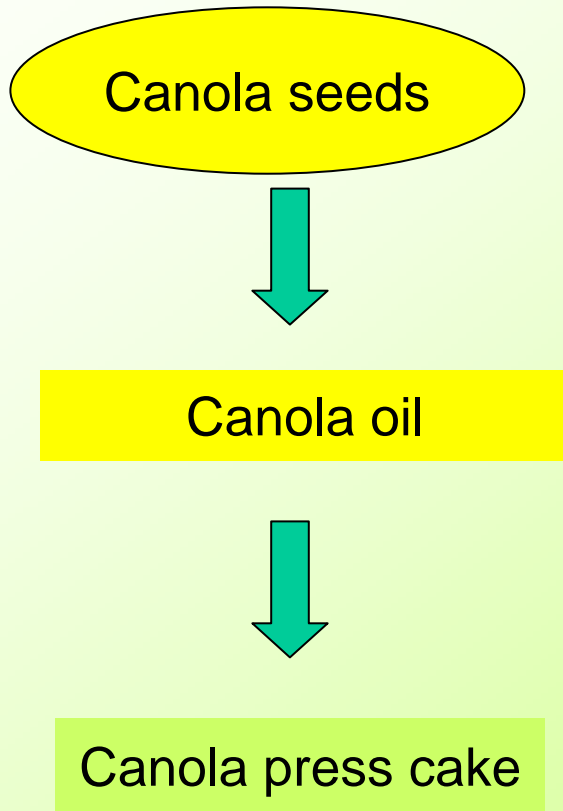
Canola oil by-product



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Recent developments

Antioxidative compounds of canola oil by-product for stabilization of canola bulk oils and emulsion



(Thiyam, 2005)

Current opportunities for canola oil by-product



Endogenous antioxidants of canola ?



In the wake of

- newly identified antioxidative compounds from canola
- Customer preference of naturally derived antioxidants

Canola oil value addition in terms of oxidative stability and functionality

Canola proteins



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Recent developments

Phenolics of soy and canola



Canola contains 9-11 times more phenolics than soy!

Recent developments in canola phenolics



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- Canolol or Vinylsyringol potent antioxidative and antimutagenic activity (Studies in Finland and Japan, 2003-2005)
- Sinapic acid rich phenolic fractions of canola extracts potent antioxidative compound in bulk lipid models (Thiyam et al., 2005)
- Sinapine a crucial component of several plant based Chinese medicines with wide biological activities (several studies)

Antioxidative compounds of canola press cake

- Isolation and application (several studies)

Protein ingredients market



Nutritional properties

- Key factors driving market growth mainly in U.S.
- Complete in amino acids
- Basis for sports nutrition drinks, infant formulas, nutritional bars, nutritional supplements

Functional properties

- Primary agents for sustained market growth
- Used in food applications e.g
- Improving texture mouth feel, gelling, stabilizing emulsions, binding meat, water binding, foaming, whipping properties

U.S. protein ingredients market



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- Whey protein
- Casein/Caseinates
- Gelatin
- Egg protein
- Soy protein
- Wheat gluten
- Canola ? (yet to be introduced!)



U.S. protein ingredients market



Soy protein market revenue the highest alongwith highest growth rate

Annual growth rate at 2004, 10.6 percent driven by functional beverages and sports nutrition market

40% revenues represent **nutrition applications**



Canola proteins: today and tomorrow!



Soy proteins –

- recognized for human consumption!
- Existing mature market
- U.S. FDA approved health benefits (more than 6.25 g soy proteins in foods)

Canola proteins –

- potential introduction for human consumption in the market in near future!
- U.S. FDA yet to approve as fit for human consumption (Burcon and ADM joint venture www.burcon.ca)



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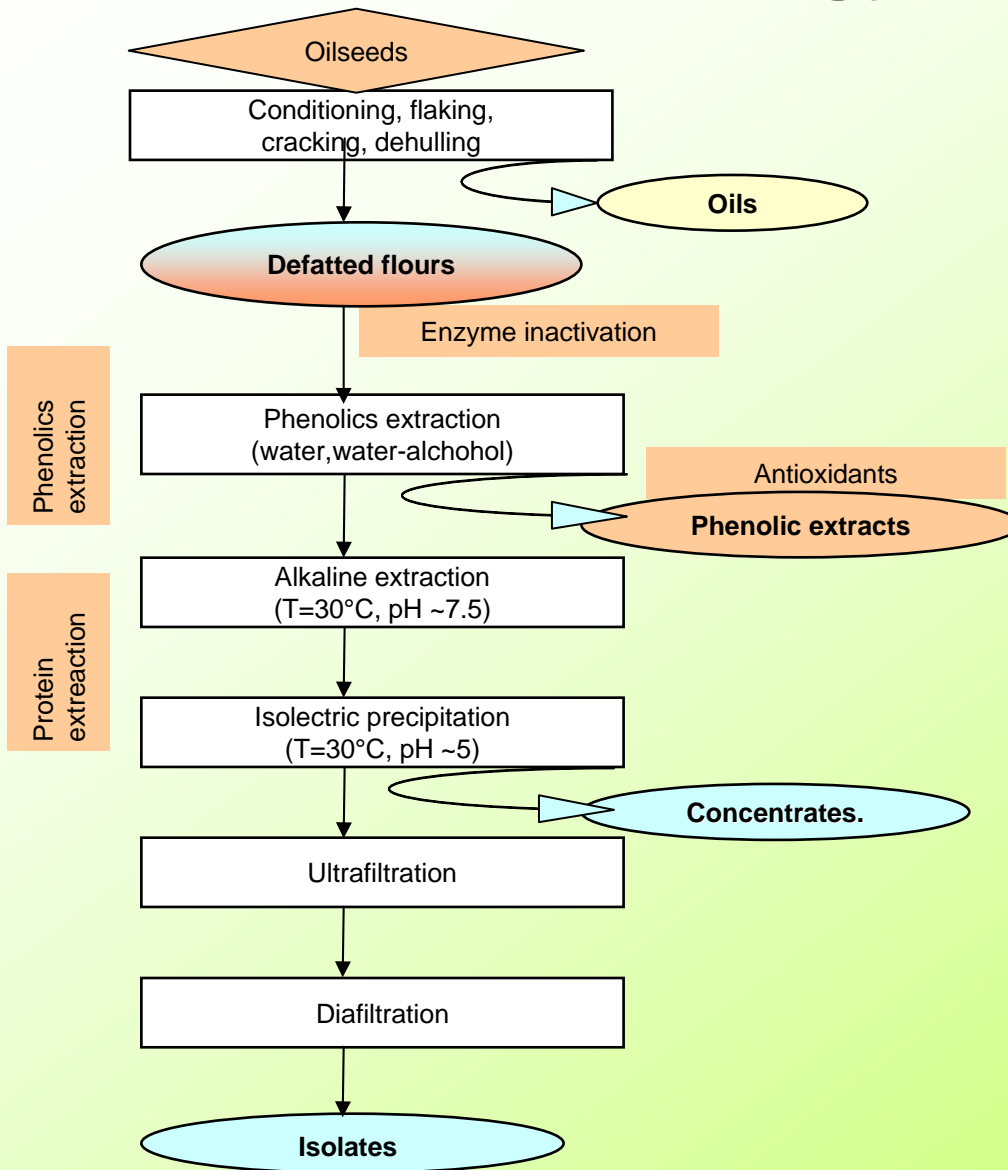
Process technology for canola proteins

Process technology for proteins



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Technology barriers



| Soy | Canola |
|---|--|
| Okara (soy fibre) is a food and feed ingredient | Fibre still a barrier ! |
| off flavours still a problem? | Oxidation of phenolics a major hindrance to protein extraction |



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Functionality of canola proteins

.....for soy the market proved it...!

The positive functional properties of canola and soy protein isolates as well as concentrates makes it important ingredients for functional foods.

Application in experimental bakery products



Application of canola protein concentrate in sausages, models drinks etc....



For soy proteins, applications are VAST! Products are common!

For canola proteins it is yet to come!

Phytochemicals of canola



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| Soy | Canola |
|---------------------|------------------|
| • Isoflavones | -- |
| • Sterols | Yes |
| • Saponins | -- |
| • Phytic acid | Yes |
| • Trypsin inhibitor | -- |
| • Tocopherols | Yes |
| • Lecithin | Yes |
| | Glucosinolates ? |

Phytochemicals- adds to the value of soy products!

Health benefits of soy-based ingredients



- Cholesterol reduction (heart health)
- Increased bone density (bone health)
- Menopausal symptom relief
- Cancer prevention
- Faster muscle recovery (performance nutrition)
- Weight management (satisfying hunger)
- Antioxidative proteins

Canola proteins

- Bile acid binding (in-vitro)
- Free radical scavenging activity
- Bioactive peptides
(yet to come !)

Summary



Canola proteins are not used for human food applications yet but studies indicates that it has excellent techno-functional properties as compared to soy proteins!

In brief - soy and canola proteins may be ingredient partners of tomorrow!

Summary



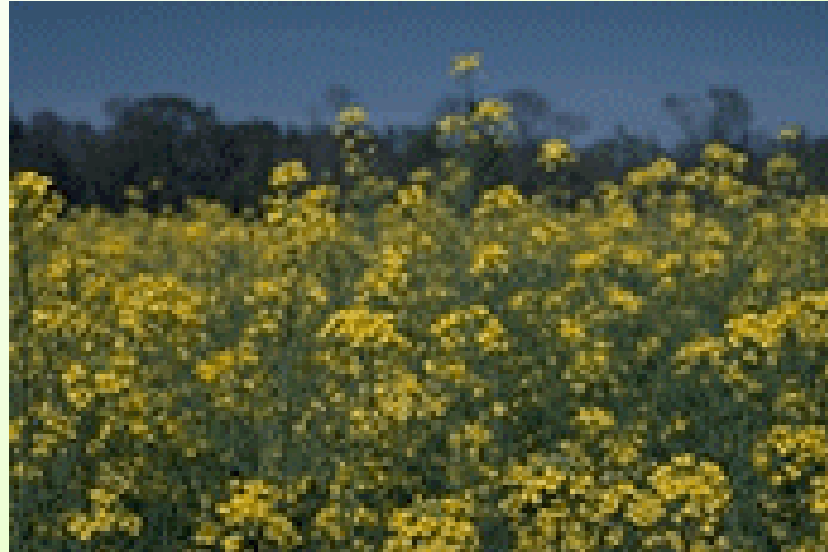
Antioxidants are a vital ingredient in food processing.

With the growing concerns of consumers there are opportunities for canola meal as sources of valuable natural ingredients.

Canola the Canadian creation!



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Canola meal: More than expected !



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Thank you for your attention!

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