

Product Development and Marketing  
of Sea Buckthorn:  
What Makes a Product Successful?

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# Food



# Food supplements



# Personal care products



# Pharmaceutical products

- Sea Buckthorn Flavone tablets (XINDAKANG in China)
- Medines based on sea buckthorn leaf extracts (HIPORAMIN in Russia)

# Important factors for product success

- Identification of consumer needs
- Product concept
- Selection of raw material
- Selection and optimisation of processing technology
- Verification of product safety
- Substantiation of health effects
- Marketing message/health claims
- Access to marketing channel/partners
- Compliance with legislations

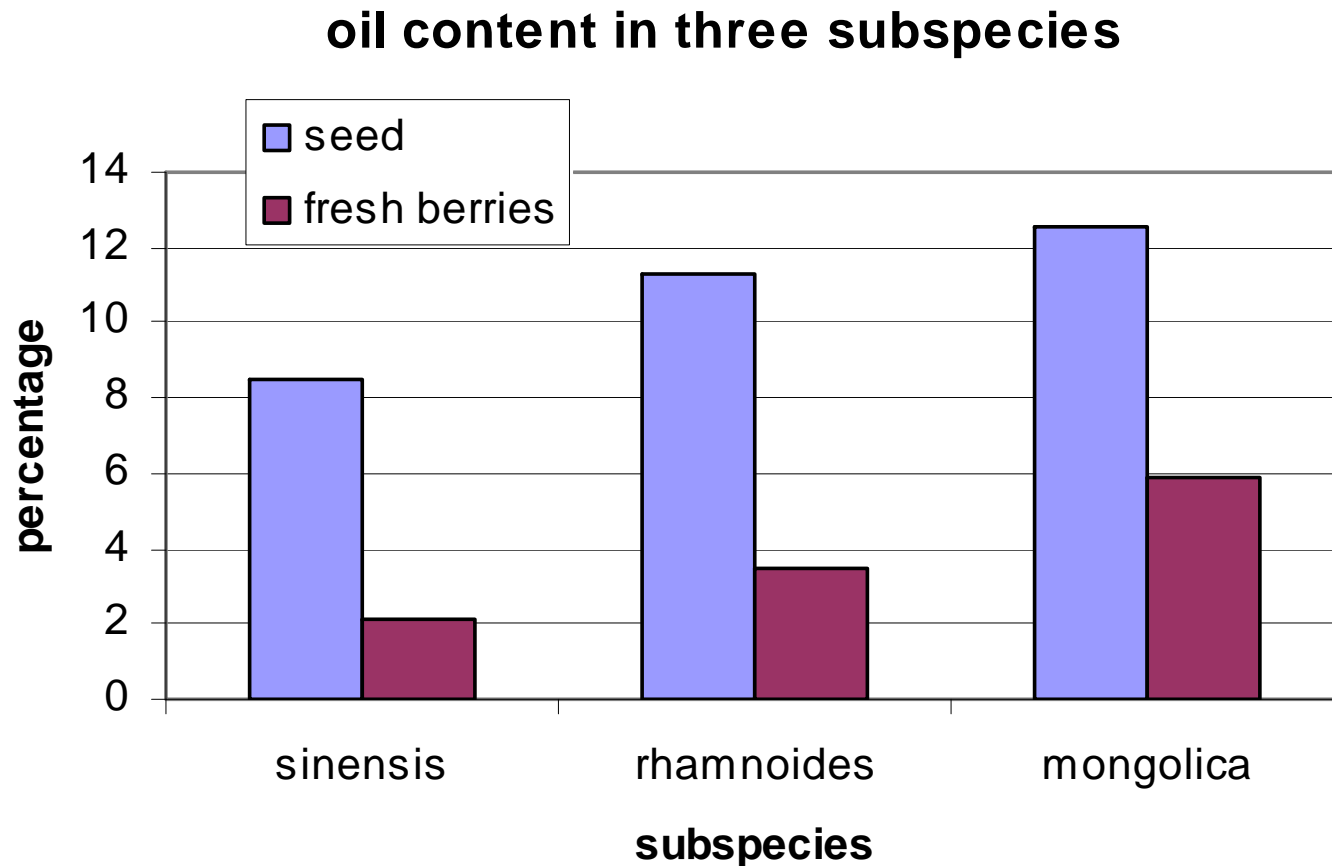
# Identification of customer needs

- Market research
- Customer feedback
- Target group
- Functions of coming product (health effects etc)
- Main active components/ingredients or characteristic composition required for specific functions

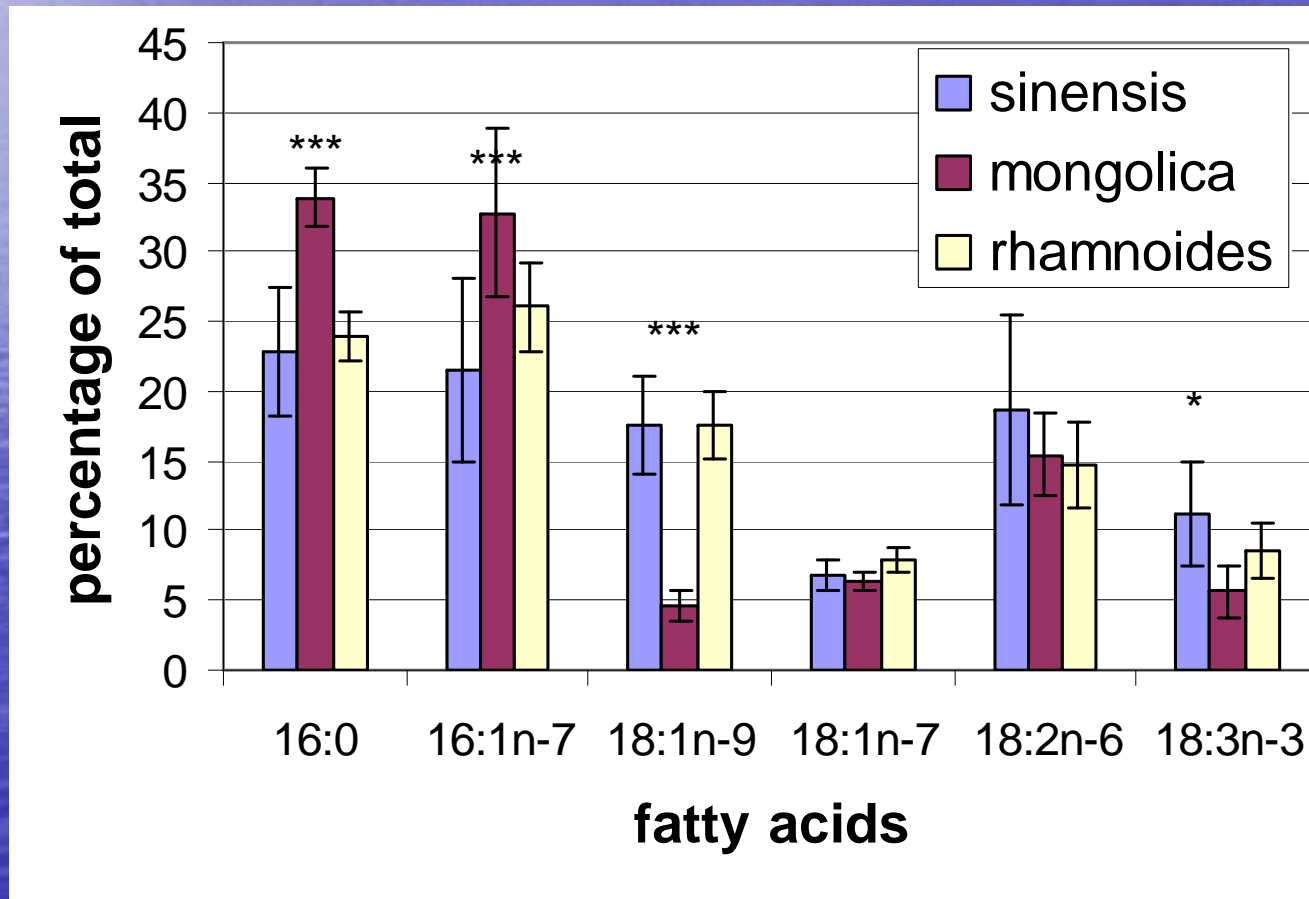
# Selection of raw material

- General composition of sea buckthorn
  - Berries: whole berries, seeds, soft parts, juice
  - Leaves, bark, twigs ...
- Variation among different subspecies different subspecies
- Compositional characteristics of subspecies, varieties, cultivars
- Best harvesting time for different purposes
- Environmental conditions at growth sites
- Availability and price
- Sustainable use of resources

# Oil content in seeds and berries of different subspecies/cultivars



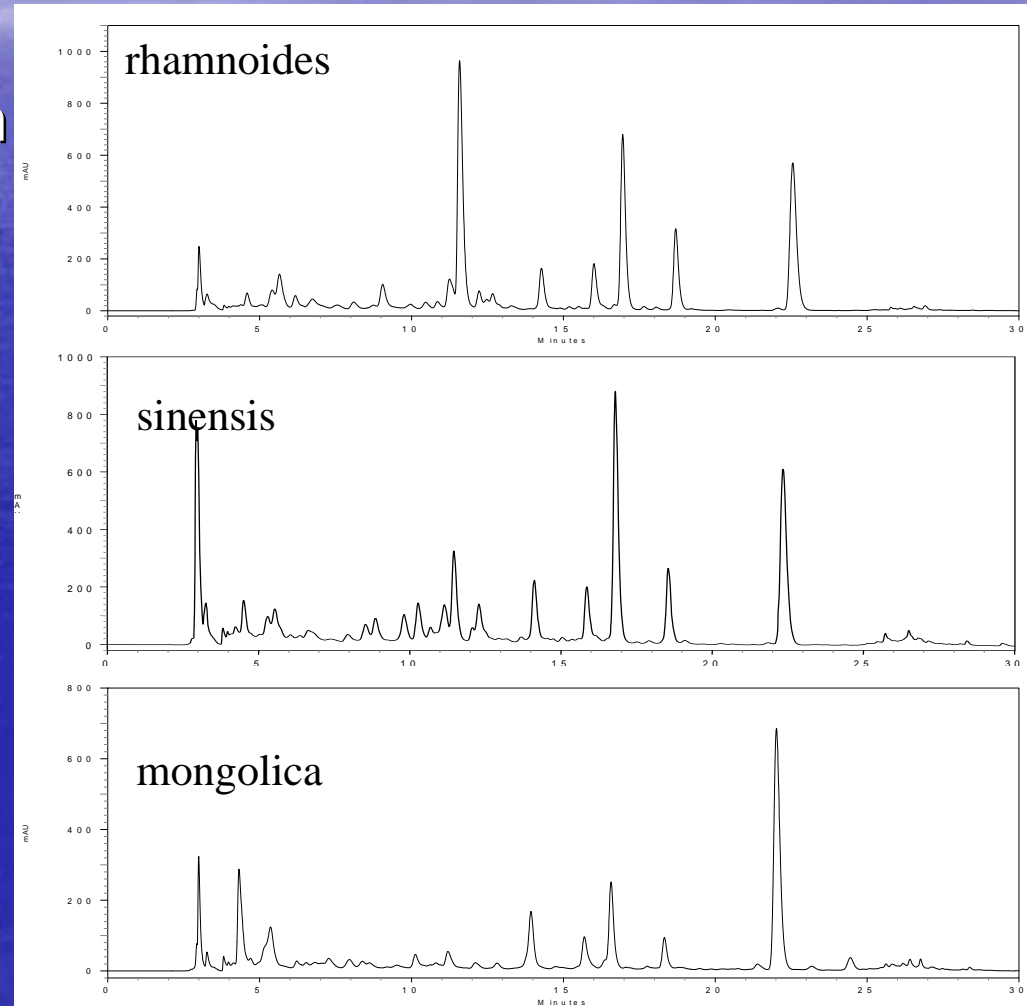
# Fatty acid composition of in fruit pulp of different subspecies of sea buckthorn



# Flavonol glycosides in three subspecies of sea buckthorn

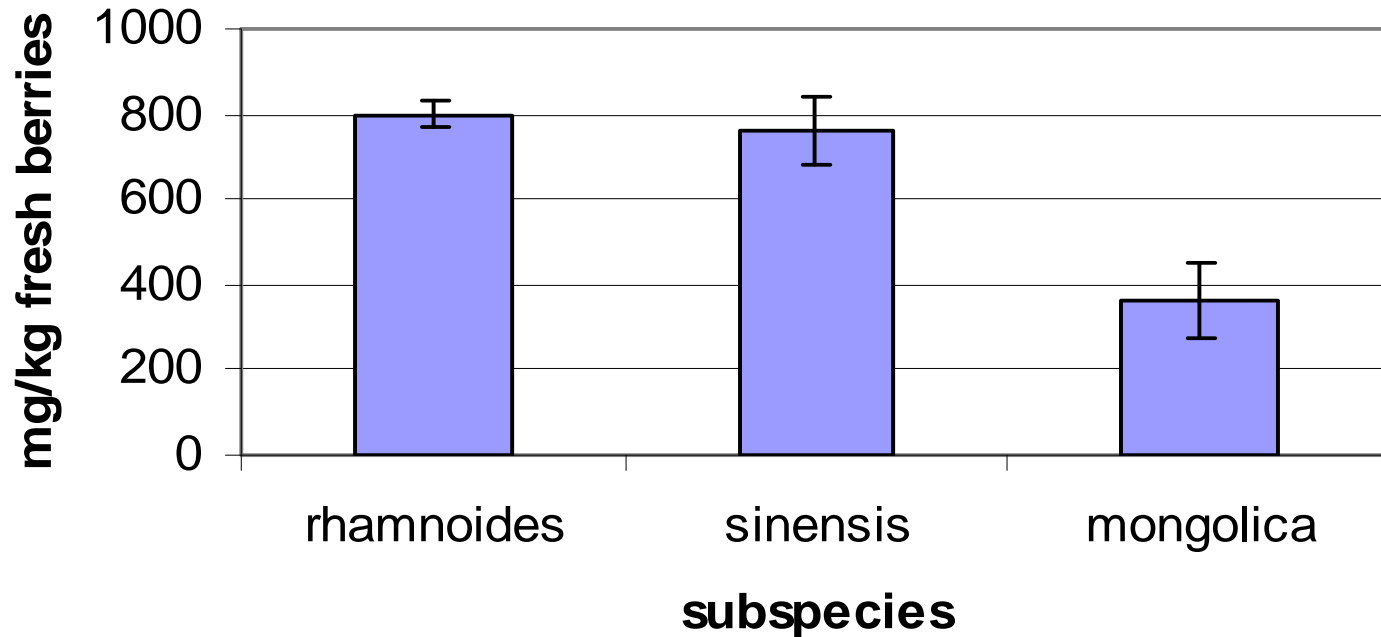
1. Isorh-3-soph-7-rhm
2. Quer-3-rut
3. Quer-3-glu
4. Isorh-3-rut
5. Isorh-3-gluk
6. Floridzin (is)

1 2 3 4 5 6

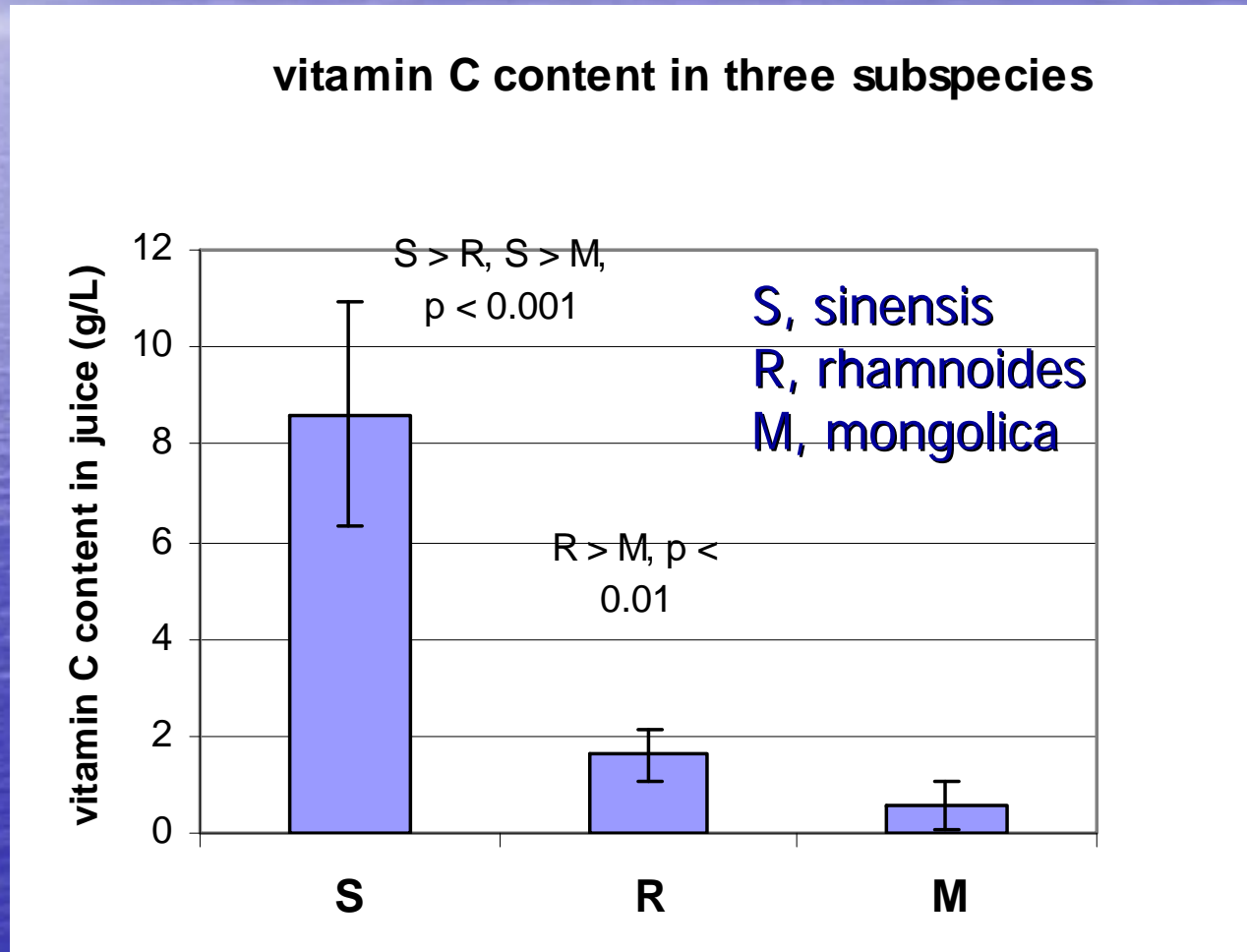


# Clear difference in flavonol content among different subspecies

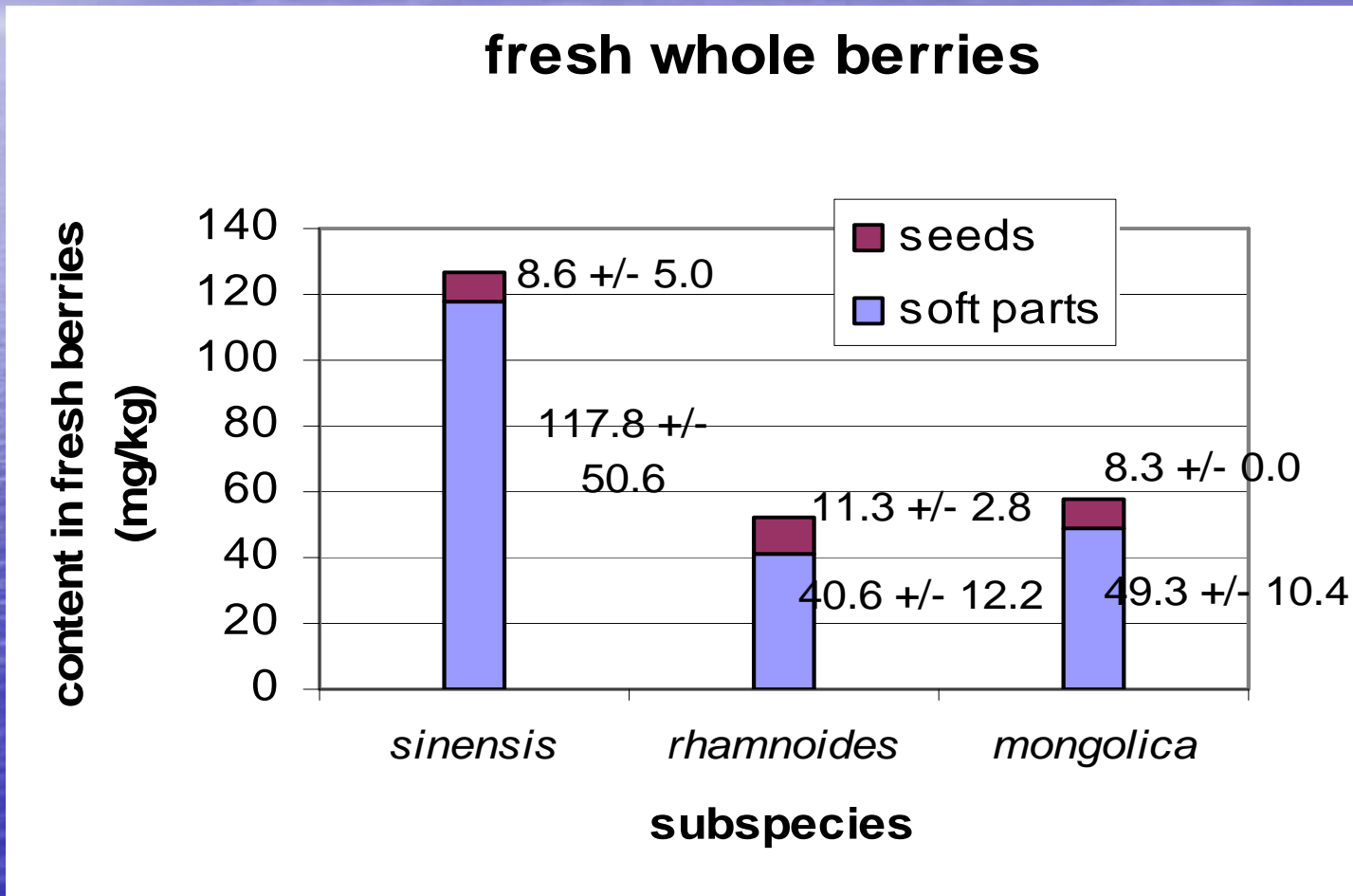
**total content of flavonols in sea buckthorn berries**



# Vitamin C content varies over ten-folds among subspecies

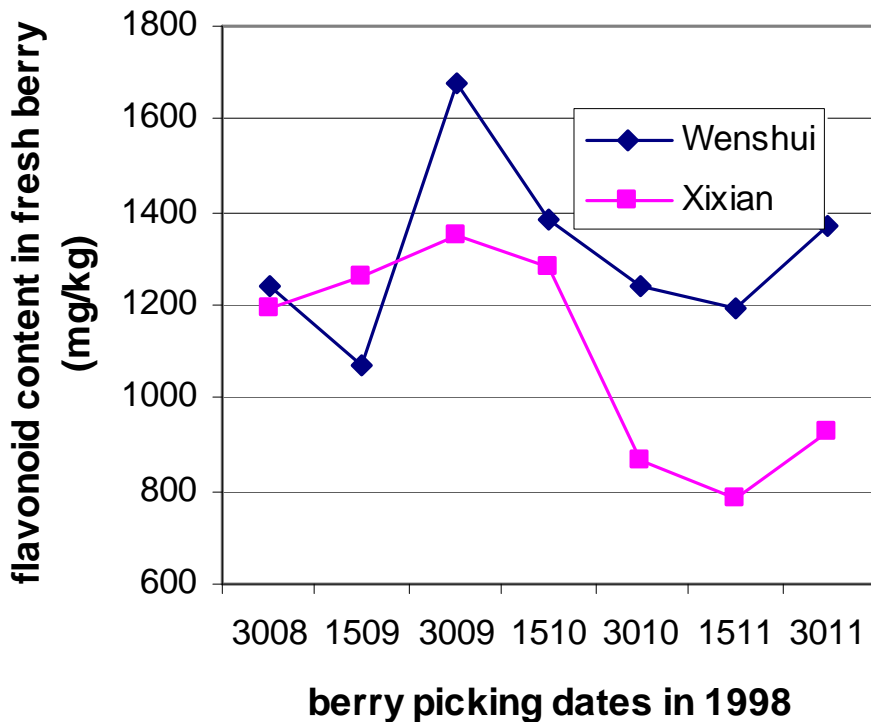


Higher content of tocopherols in ssp. *sinensis* compared with ssp. *rhamnoides* and *mongolica*

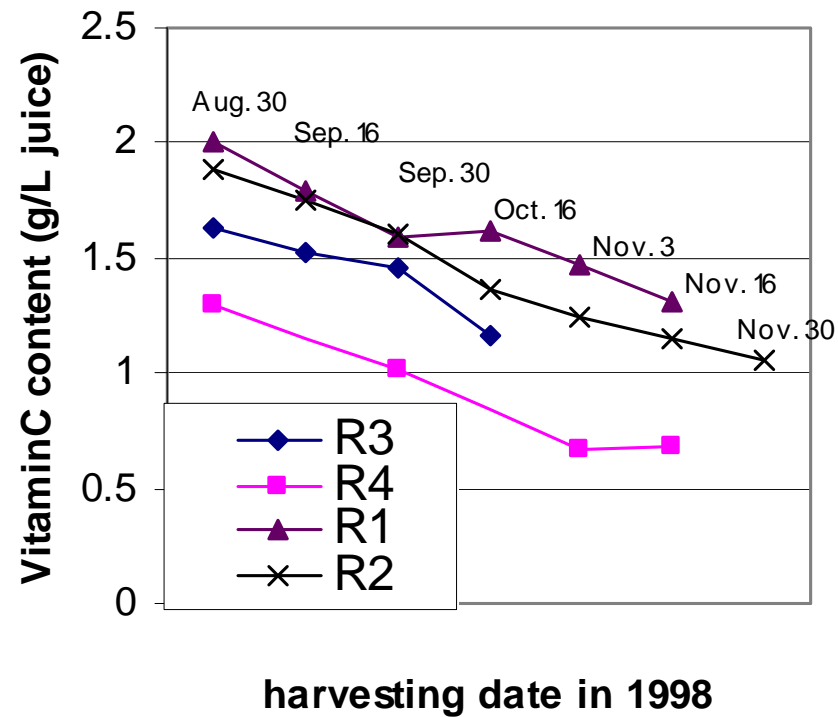


# Harvesting date influences berry composition

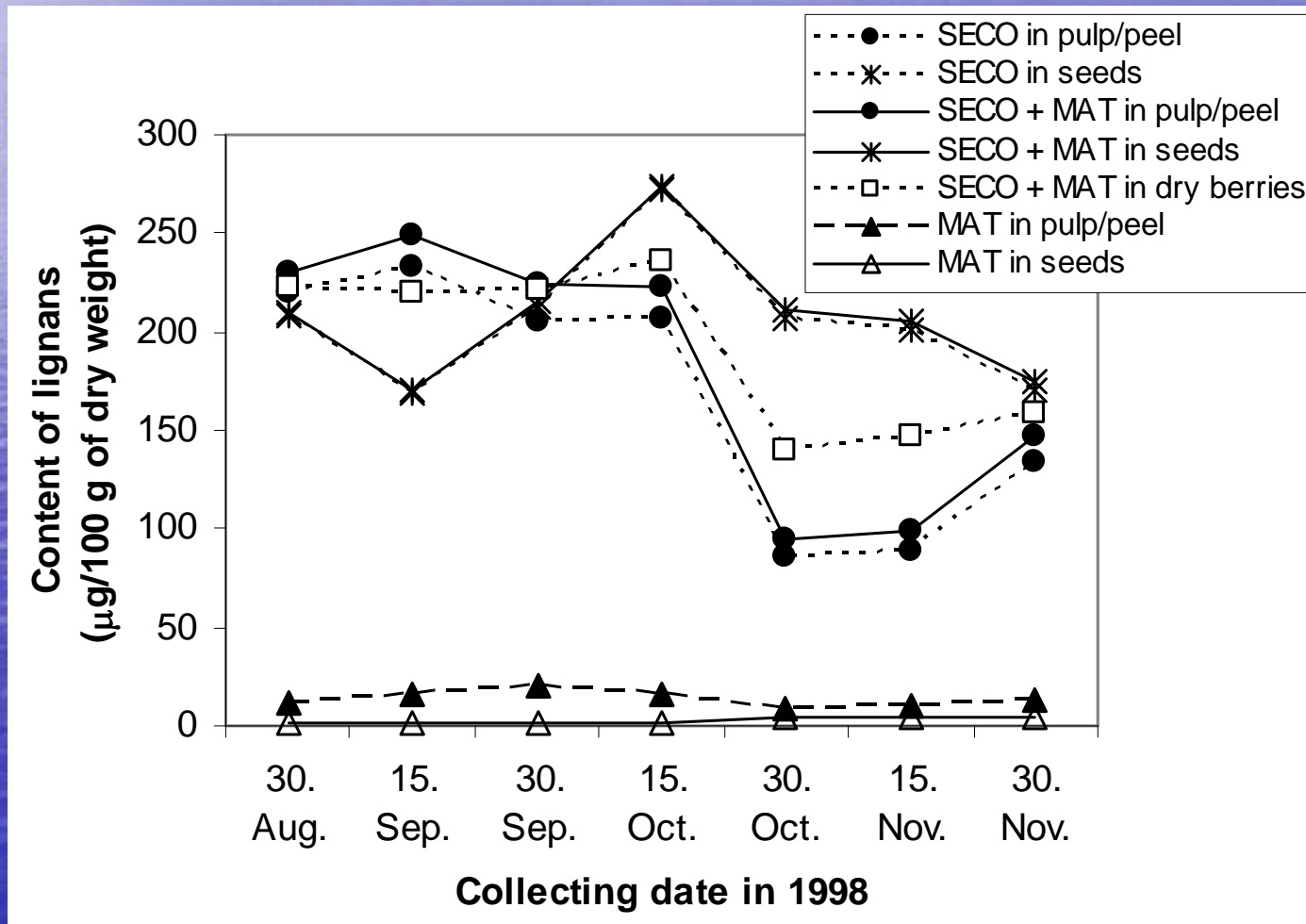
## Flavonols in berries



## vitamin C in berry juice



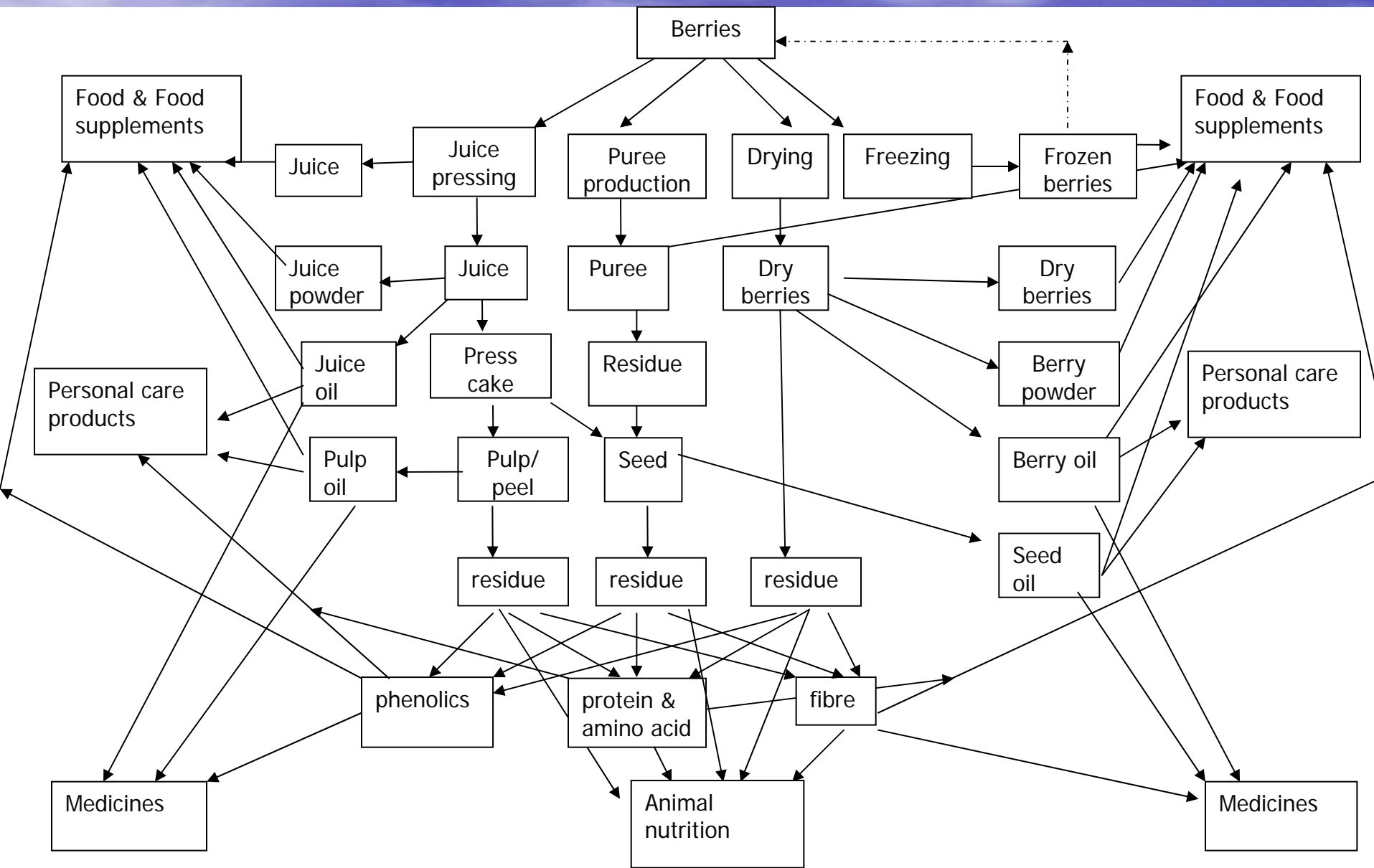
# Content of lignans changes with harvesting time



# Influence of environment on quality of raw materials

- Heavy metals
- Organic pollutants
- Agricultural chemicals

# Selection of processing technologies



# Selection and optimisation of processing technology

- Preservation of targeted bioactive components
- Enrichment of targeted bioactive components
- Standardisation of product composition
- Removal of contaminants from raw material
- No introduction of new contaminants and harmful components
- Strict control of microbes at all stages of handling and processing
- Environment friendly processes
- Cost

# Production of sea buckthorn oil

## • **CONTROL OVER THE WHOLE PRODUCTION CHAIN**



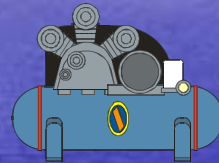
**berries**

- variety
- harvesting time
- pre-handling
- storage & transportation
- chemicals and hygiene



**juice  
pressing**

- parameters
- hygiene and contamination
- storage
- transportation



**drying  
of pomace**

- temp. time etc
- oxida. hydrolysis etc
- hygiene and contamination
- storage
- transportation



**oil  
extraction**

- oxida. hydrolysis etc
- solvents residues.
- hygiene and contamination
- storage



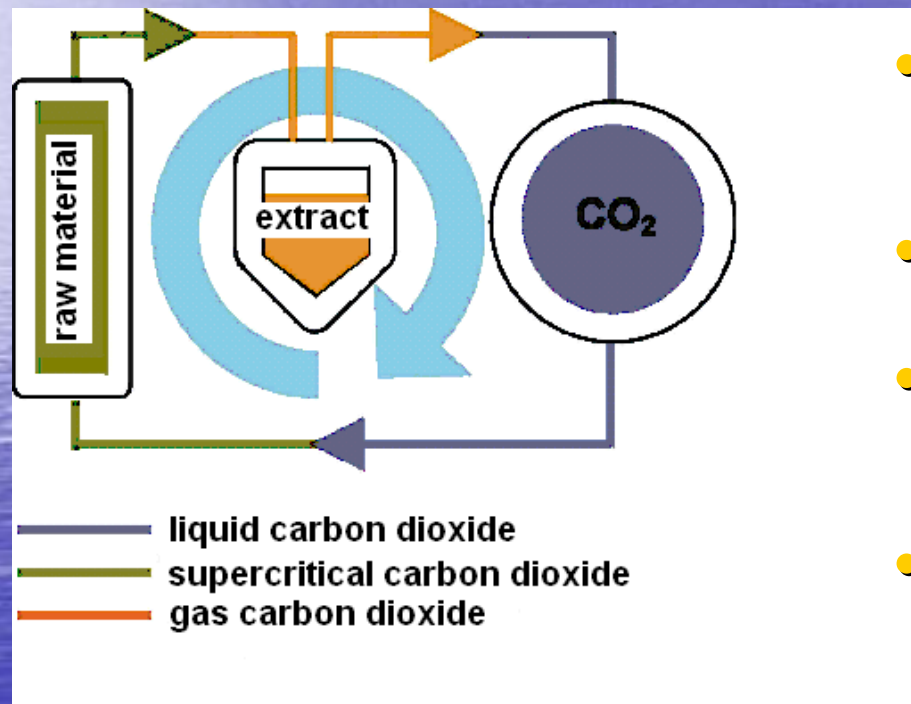
**post -  
handling**

- analysis
- standardisation
- quality control
- hygiene and contamination
- encapsulation
- storage and transportation

# Oil production technology

- Cold pressing
- Conventional solvent extraction
- Extraction with vegetable oil
- Centrifugation
- Enzyme technology
- Supercritical CO<sub>2</sub> extraction

# CO<sub>2</sub> extraction Technology



- *Liquid CO<sub>2</sub> is changed to supercritical CO<sub>2</sub> with pressure and temperature.*
- *Supercritical CO<sub>2</sub> flows through raw material and carries lipids .*
- *Supercritical CO<sub>2</sub> changed gas phase; extracted lipids and volatiles separate from CO<sub>2</sub>*
- *Gas phase CO<sub>2</sub> returns to liquid phase for a new cycle.*

# Advantage of CO<sub>2</sub> Extraction Technology

- low oxygen-pressure
- closed system → *no oxidation*
- low temperature → *no temperature-caused damage*
- microbes not extracted → *aseptic extracts*
- no solvent → *no solvent residue, healthy environmental friendly*
- gentle → *bioactives in natural form*

# Phenolics in sea buckthorn berry pomace (mg/100g)

total phenolic acids <b>230 (14%)</b>	Gallic acid 104 (45%)	p-coumaric acid 49 (21%)	Protocatechuic acid 25 (11%)	Others 52 (23%)
flavonols <b>101 (6.2%)</b>	Quercetin 32 (32%)	Kaempferol 19 (19%)	Isorhamnetin 50 (50%)	
Proanthoc. <b>1150 (70%)</b>	P1-P3 160 (14%)	P4-P7 116 (10%)	➤P7 870 (76%)	
ellagitannins <b>153 (9.4%)</b>	ellagic acid 153 (100%)			

# Phenolics in sea buckthorn buckthorn berry pomace extracts

	Solub. phen. acids	Flavonol	Proantho.	ellagitann	total	dry matter
Water	35%	30%	0.3%	-	2.8%	
70% EtOH	71%	81%	5.8%	4.9%	11%	15%
94% EtOH	45%	49%	1.1%	3.9%	5.5%	
<b>Cellulase</b>	<b>104%</b>	<b>101%</b>	<b>44%</b>	<b>39%</b>	<b>47%</b>	<b>36%</b>
Pectinase	77%	105%	31%	36%	37%	25%
Protease	54%	87%	28%	31%	32%	
Esterase	61%	89%	37%	33%	38%	

# Verification of product safety

- Toxicity/side effects
- Allergens
- Microbiological quality
- Heavy metals
- Pesticides
- PAH and other environmental pollutants
- Product stability

# Substantiation of health effects

- Cosmetics and personal care products
  - in vitro studies
  - in vivo human studies
- Functional foods and food supplements
  - in vitro
  - animal studies
  - human intervention studies
- Pharmaceutical products
  - in vitro
  - animal studies
  - clinical studies
- Legislations in different regions and countries

# Marketing message and claims

- Positive
- Consumer understandable
- International and local regulations on nutrition/health claims
  - Codex Alimentarius guidelines
    - 1991: general guideline on claim
    - 1997: nutrition claims
    - 2004: health claims
  - EU food labelling directive 2000/13/EC
  - EU health claim directive EC 1924/2006 (in force as of July 1, 2007)

# EU health claim directive EC 1924/2006 (as of July 1, 2007)

- Nutrition and health claims shall be based on scientific data
- Nutritional and health effects by realistic amount of daily intake of the products
- Labelling requirements for products bearing claims
- A list of permitted nutrition claims and conditions for using the claims (July 1, 2007)
- Specific nutrient profiles and conditions for products to bear nutrition and health claims (January 1, 2009)
- A list of permitted health claims and conditions for using the claims (January 31, 2010)
- Procedures for applying for new claims defined

# Marketing channels/partners

- Direct marketing through
  - Supermarkets
  - Health shops
  - Pharmacies
  - Internets
  - Therapy centers
  - Beauty shops and saloons
- In cooperation with partners
  - Supermarkets
  - Health shops
  - Pharmacies
  - Internets
  - Therapy centers
  - Beauty shops and saloons

# Compliance with legislations

- Food regulations
- Food supplement regulations

## In Europe

- EU Food Supplement Directive (2002/46/EC)
- EU food laws and regulations
- EU Novel food regulations (EC No 258/97)
- EU health claim directive 1924/2006
- Cosmetic regulations
- Pharmaceutical product regulations

# Omega 7<sup>®</sup> / Membrasin<sup>®</sup> Sea Buckthron Oil Capsule

- Introduced in 1998 by Aromtech Ltd (Finland)
- CO<sub>2</sub> extracted oil
- Vegetable capsule
- Standardised composition
- Health effects substantiated by a series of product-specific scientific studies
- Quality standard ISO 9001
- Environmental standard ISO 14001
- Finnish "Supplement of the Year" Award in 2000
- Marketed in 12 countries

# Examples of studies carried out with Omega 7<sup>®</sup>/Membrasin<sup>®</sup>

- SKIN

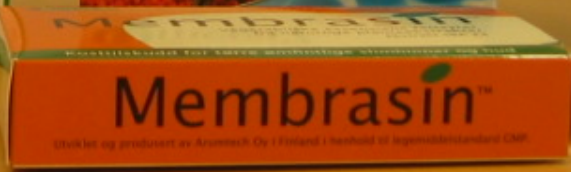
- Omega 7<sup>®</sup> oils improve atopic eczema
- Omega 7<sup>®</sup> oils have anti-inflammatory and analgesic effects

- MUCOUS MEMBRANES

- Omega 7<sup>®</sup> oils protect gastric mucosa, cure gastric ulcer
- Omega 7<sup>®</sup> improves dry mouth conditions
- Omega 7<sup>®</sup> regenerates uro-genital mucous membranes

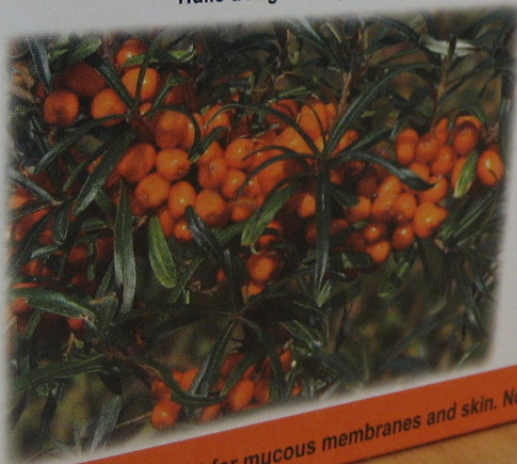
- CARDIOVASCULAR HEALTH

- Omega 7<sup>®</sup> oil increase in HDL-cholesterol level
- Omega 7<sup>®</sup> inhibits of platelet aggregation



Sea Buckthorn Oil (SBA24)  
**Omega7**<sup>®</sup>

Huile d'Argousier (SBA24)



Each capsule contains 145 mg  
Omega-7 fatty acids.  
Chaque capsule contient 145 mg  
d'acides gras Omega7.

Food supplement  
Complement alimentaire

60  
**VEGE**  
CAPS

Contents: 60 capsules (42 g)

Security Seal. Sceau de sécurité.

Nutritional support for mucous membranes and skin. Nourrit et protège la peau et les muqueuses.

Sea Buckthorn Oil (SBA24)  
**Omega7**<sup>®</sup>  
Huile d'Argousier (SBA24)

# Summary

- Consumer oriented product concept
- Full understanding and control of the raw material
- Carefully selected optimised technology
- Standardised product composition
- Product safety and efficacy
- Marketing channel and marketing strategy
- Understanding and compliance with legislations (international and regional)