

FUNCTIONAL FOOD: **FUNCTIONAL FOOD FROM** **ANIMAL SOURCES**

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THE OUTLINE

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PERTEMUAN	URAIAN
Minggu ke 4 Oktober	Senyawa Bioaktif dalam Bahan Pangan Hewani
Minggu ke 5 Oktober	Serat Makanan
Minggu ke 1 November	UTS
Minggu ke 2 November	Probiotik dan Prebiotik
Minggu ke 3 November	Mono, Oligo sakarida dan Gula alkohol
Minggu ke 4 November	Vitamin dan Mineral



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THE OUTLINE

INTRODUCTION

FISH, EGG, MEAT PRODUCT

BEE PRODUCT

DAIRY PRODUCT



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INTRODUCTION

EARLY TO MID 1900'S:

Nutrient Deficiency Prevention



INTRODUCTION

LATE 1900'S:



Chronic Disease Prevention

INTRODUCTION

**FOODS THAT PROVIDE
HEALTH BENEFITS BEYOND
BASIC NUTRITION**

**FOODS IN WHICH THE
CONCENTRATION OF ONE
MORE INGREDIENTS HAVE
BEEN MANIPULATED OR
MODIFIED TO ENHANCE
THEIR CONTRIBUTION TO A
HEALTHFUL DIET**



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OMEGA -3

SOURCE : FISH OIL , EGG

OMEGA-3 (N-3) FATTY ACIDS ARE AN ESSENTIAL CLASS OF **POLYUNSATURATED FATTY ACIDS (PUFAS)**

N-3 FATTY ACIDS PLAY AN IMPORTANT ROLE IN **CVD**

BANG AND DYERBERG (1972) REPORTED THAT ESKIMOS HAD LOW RATES OF THIS DISEASE DESPITE CONSUMING A DIET WHICH WAS HIGH IN FAT

CONSUMPTION OF 35 G OR MORE OF FISH DAILY HAS BEEN SHOWN TO REDUCE THE RISK OF DEATH FROM NO SUDDEN MYOCARDIAL INFARCTION (DAVIGLUS ET AL., 1997)



CONJUGATED LINOLEIC ACID (CLA)

AN ANTICARCINOGENIC FATTY ACID KNOWN AS CONJUGATED LINOLEIC ACID (CLA) WAS FIRST ISOLATED FROM GRILLED BEEF IN 1987

CLA refers to a mixture of positional and geometric isomers of linoleic acid (18:2 n-6) in which the double bonds are Conjugated instead of existing in the typical methylene interrupted configuration

CLA IS UNIQUE IN THAT IT IS FOUND IN HIGHEST CONCENTRATIONS IN FAT FROM RUMINANT ANIMALS (E.G., BEEF, DAIRY, AND LAMB)



CONJUGATED LINOLEIC ACID

**BEEF FAT CONTAINS 3.1 TO 8.5 MG CLA/G FAT
WITH THE 9-CIS AND 11-TRANS ISOMERS
CONTRIBUTING 57- 85% OF THE TOTAL CLA
(DECKER, 1995)**

**CLA INCREASES IN FOODS THAT ARE
COOKED AND/OR OTHERWISE PROCESSED**

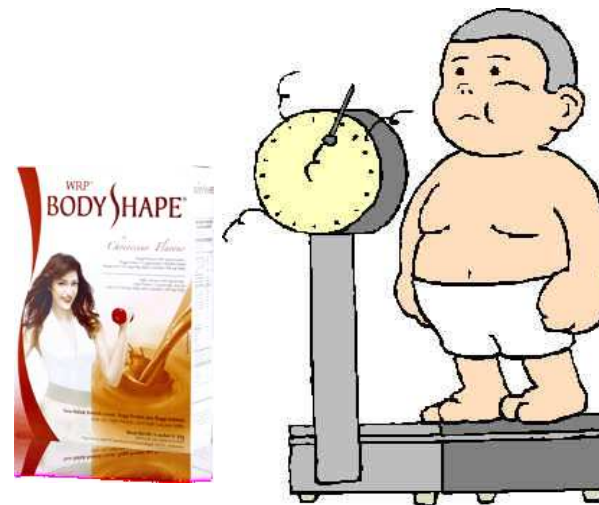
**CLA SHOWN TO BE EFFECTIVE IN
SUPPRESSING FOR STOMACH TUMORS IN MICE,
ABERRANT COLONIC CRYPT FOCI IN RATS,
AND MAMMARY CARCINOGENESIS IN RATS (IP
AND SCIMECA, 1997)**



CONJUGATED LINOLEIC ACID

CLA HAS BEEN INVESTIGATED FOR ITS ABILITY TO CHANGE BODY COMPOSITION, SUGGESTING A ROLE AS A WEIGHT-REDUCTION AGENT

MICE FED CLA-SUPPLEMENTED DIETS (0.5%) EXHIBITED 60% LOWER BODY FAT AND 14% INCREASED LEAN BODY MASS RELATIVE TO CONTROLS (PARK ET AL., 1997), POSSIBLY BY REDUCING FAT DEPOSITION AND INCREASING LIPOLYSIS IN ADIPOCYTES



COLIN

SOURCES : MILK, EGG

**SOURCES OF VITAMIN D , FORM
FOSFATIDILKOLIN (LESITIN)**

**INTRASEL COMMUNICATION,
BIOENERGI, NEUROTRANSMITER
ASETILKOLIN (PERFORM COLIN
FOR BRAIN FUNCTION)**



CARNITINE

SOURCES : BEEF, POULTRY, MILK, FISH

KARNITIN MERUPAKAN PRODUK TURUNAN DARI SALAH SATU ASAM AMINO, YAITU LISIN

KARNITIN BERFUNGSI UNTUK MEMBANTU MEMINDAHKAN ZAT LEMAK KE MITOKONDRIA, YANG DAPAT DIPAKAI UNTUK MENGHASILKAN ENERGI

KONSUMSI KARNITIN SECARA TERATUR DAPAT MEMBANTU MENGURANGI TINGKAT YANG TIDAK NORMAL PADA TRIGLISERID, UNSUR LEMAK DALAM DARAH



SQUALENE

SOURCES : MINYAK HATI IKAN HIU

SUATU HIDROKARBON DAN TRITERPEN YANG MERUPAKAN **KOMPONEN ALAMI** DAN BAGIAN PENTING DALAM SINTESIS KOLESTEROL, HORMONE STEROID, DAN VITAMIN D PADA TUBUH MANUSIA

SQUALEN BANYAK DIGUNAKAN DALAM KOSMETIK DAN PELEMBAB ALAMI

***IMMUNOLOGIC ADJUVANT* PADA VAKSIN**





BEE PRODUCT

MADU

flavonoid sebesar 6000 μ g/kg

Gula (Fruktosa + Sukrosa)

79,4 %

Mineral (Na, Ca, Mg, Cu, Al, Mn, Fe, K & P)

0,2 %

Protein

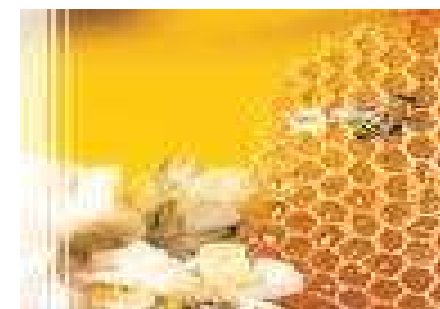
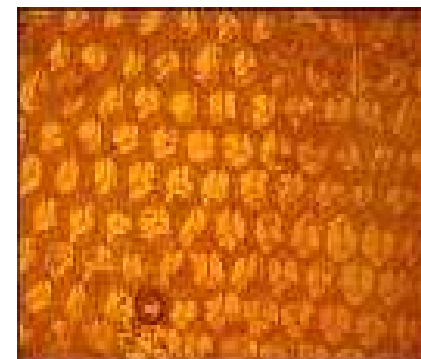
0,5 %

Air

17,2 %

Vitamin (B1, B2, B3, K & C)

2,7 %





BEE PRODUCT

PROPOLIS

PROTEIN, ASAM AMINO, VITAMIN, MINERAL, FLAVONOID DENGAN KANDUNGAN SENYAWA FENOLIK (FLAVONOID, ASAM-ASAM ALDEHID, DAN ESTER AROMATIK)

MENGINAKTIFKAN ENZIM YANG BERPERAN DALAM METABOLISME SEL MIKROBA, MENURUNKAN TEGANGAN PERMUKAAN SEL, MERUSAK MEMBRAN DAN MENEMBUS DINDING SEL SERTA MENDENATURASI PROTEIN SITOPLASMA





BEE PRODUCT

BEE POLEN

10 AA ESENSIAL

ASAM LEMAK ESENSIAL

VITAMIN C SEBESAR 0,7-1,5 MG



ROYAL JELLY

**PROTEIN, ASAM AMINO ESENSIAL, LEMAK ,
KANDUNGAN PROTEIN MENCAPAI 13%. SALAH
SATU DI DALAM ROYAL JELLY DISEBUT
ROYALISIN MEMILIKI KEMAMPUAN SEBAGAI
ANTIBIOTIK MELAWAN BAKTERI GRAM POSITIVE**



DAIRY PRODUCT

**ALMOST ALL MILK COMPONENTS
MAY CONTRIBUTE POTENTIAL
HEALTH BENEFITS - INCLUDING**

- **Proteins**
- **Peptides**
- **Lipids**
- **Minor Carbohydrates**
- **Minerals**
- **Vitamins**

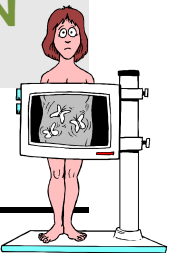
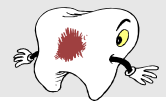


DAIRY PRODUCT

- **ANTI-MICROBIAL – INCLUDING CONTROL OF GUT MICROFLORA**
- **ANTI-VIRAL**
- **BINDING OF E COLI AND CHOLERA ENTEROTOXINS**
- **ANTI-CANCER**
- **IMMUNOMODULATION**
- **ANTI-OXIDATIVE**
- **RETARD OSTEOPOROSIS**

DAIRY PRODUCT

PRODUCT CLASS	PRODUCT	CLAIMED PROPERTIES
BIOACTIVE PEPTIDE	GLUTAMINE PEPTIDE	MAINTAIN IMMUNE SYSTEM REGULATE PROTEIN GLYCOGEN REPLENISHMENT
	PEPTIDE FM	INHIBIT DIETARY FAT DEPOSITION ALTER FAT METABOLISM
	CASEIN PHOSPHOPEPTIDASE	ENHANCE Ca AND Fe ABSORPTION PREVENTION DENTAL CARIES
BIOACTIVES PROTEIN	LACTOPEROXIDASE	PROMOTE BENEFICIAL INTESTINAL FLORA
	LACTOFERRIN	REGULATE ION TRANSPORT AND ABSORPTION PROMOTE BENEFICIAL INTESTINAL FLORA
BIOACTIVE MINERAL	LACTOVAL (NATURAL MILK CALCIUM)	ENHANCE Ca ABSORPTION



PROBIOTICS

- **LACTIC ACID MICROORGANISMS**
 - **ASSIST IN CONTROL OF THE GUT MICROFLORA**
 - **YOGURT**
 - **FERMENTED DRINKS**
- **STRONGLY STRAIN DEPENDENT**
- **SUPPORTED BY SOME CLINICAL STUDIES**



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PEPTIDES

- **PEPTIDES FROM BOTH CASEINS AND WHEY PROTEINS ARE BIOACTIVE**
- **END PRODUCT OF DIGESTION OF PROTEINS**
- **GROWING RECOGNITION THAT IN VITRO AND IN VIVO RESULTS DO NOT ALWAYS GIVE THE SAME EFFECTS**
- **MULTIPLE FUNCTIONALITY**



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CASEIN- BASED BIOACTIVE PEPTIDES

FRACTION	CONTENT (g/L)	% OF TOTAL MILK PROTEIN
TOTAL CASEIN	26.0	80.0
•ALFA-CASEIN	13.0	39.0
•BETA-CASEIN	9.3	28.4
•KAPPA-CASEIN	3.3	10.1
TOTAL WHEY	6.0	19.3
•BETA-LACTOGLOBULIN	3.2	10.0
•ALFA-LACTALBUMIN	1.2	3.1
•SERUM ALBUMIN	0.3	1.2
•IMMUNOGLOBULINS	0.7	2.0
OTHER	0.8	2.4

Other: lactoferrin, lysozyme and lactoperoxide



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CASEIN- BASED BIOACTIVE PEPTIDES

CASEIN GLYCOMACROPEPTIDE

- **CANCER PREVENTION**
- **IMMUNOMODULATION**
- **DIET SUPPRESSION**
- **CARDIOVASCULAR EFFECTS**



WHEY PRODUCT

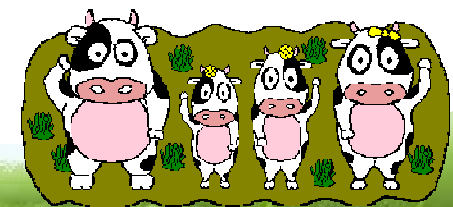
- **Whey Protein Concentrates**
 - **34 to 85% protein**
- **Whey Protein Isolates**
 - **Ion exchange and membrane processed**
- **Whey Protein Fractions**
 - **Lactoferrin, Lactoperoxidas**
- **Whey Protein Hydrolysates**
 - **Bioactive peptide concentrates**
- **Whey Salts From Permeate**
 - **Enriched in calcium salts**



WHEY PRODUCT

WHEY COMPOSITION

COMPONENT	SWEET WHEY	ACID WHEY
TOTAL SOLIDS	6.5%	6.4%
PROTEIN	0.6%	0.54%
LIPIDS	0.25%	0.05%
LACTOSE	5.0%	4.5%
ASH	0.52%	0.6%
LACTIC ACID	0.14%	0.47%

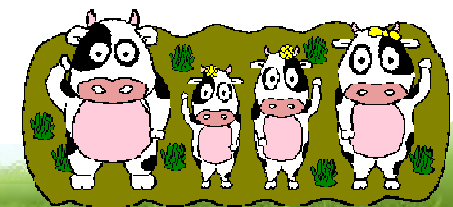


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WHEY PRODUCT

SWEET WHEY

Beta lactoglobulin	55%
Alpha lactalbumin	15%
Immunoglobulins	15%
BSA	5%
Lactoferrin	<1%
Lactoperoxidase	<1%
Casein macro peptide	10%



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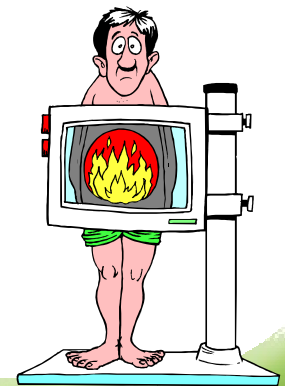
WHEY LIPIDS

- **ABOUT 50% OF WHEY LIPIDS ARE PHOSPHOLIPIDS DERIVED FROM SMALL FAT GLOBULES AND FAT GLOBULE MEMBRANE**
- **BIOACTIVE LIPIDS IN WHEY INCLUDE:**
 - **CONJUGATED LINOLEIC ACID (CLA)**
 - **SPHINGOLIPIDS**
 - **ETHER LIPIDS**
 - **BUTYRIC ACID**

WHEY PRODUCT

WPC DIGESTS

- **ENHANCE CELLULAR GLUTATHIONE LEVELS IN NORMAL PROSTATE CELLS**
- **DO NOT ALTER GLUTATHIONE LEVELS IN CANCER PROSTATE CELLS**
- **PROVIDE SOME PROTECTION AGAINST HYDROGEN PEROXIDE IN NORMAL PROSTATE CELLS**



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LACTOFERRIN

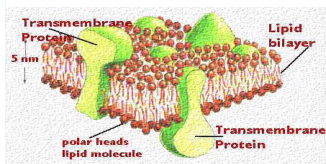
- **NATURAL SECRETION OF MILK, TEARS AND BILE**
- **ELEVATED BY INFLAMMATION AND IN SOME CANCERS**
- **ANIMAL STUDIES HAVE SHOWN ADDITION OF LACTOFERRIN PROVIDES SOME PROTECTION AGAINST SOME CANCERS**

DAIRY PRODUCT

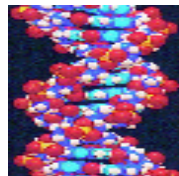
PROTECTION FROM SOME CANCERS

Cancer	WPC	LF/LP	CLA	BSA	Peptides
colon	+	+	+	+	+
breast	+		+	+	+
skin		+			
prostate	(+)		+		+
gastric			+		

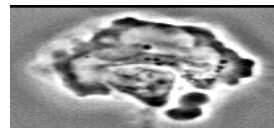
Initiation



Promotion



Progression



DAIRY PRODUCT

COMPONENTS WITH CARDIOVASCULAR EFFECT

Activity	WPC	WPI	Peptides	LF	B-vit.	Other
Hypertension	+	+	+		+	(Ca)
Anti-inflammatory	+*		+			
Anti-thrombic	+		+	+		
Reduce cholesterol	+	+				Stearic acid

MICROBIAL/VIRAL EFFECTS

Component	Anti-bacterial/viral	Toxin Binding	Pre-biotic Properties
WPC	+	+	+
A-Ig/B-Ig.		+	
Lactoferrin	+		
Lactoperox.	+		
GMP	+	+	+
Oligo-saccharides			+