

WAY FORWARD: FOOD FOR MEDICINE AND MEDICINE FOR FOOD



PROF DR SUHAILA MOHAMED
INSTITUTE OF BIOSCIENCE
UNIVERSITI PUTRA MALAYSIA



Health Problems:



- **Cardiovascular diseases and cancer : No 1 Killer GLOBALLY: > 80% all HEALTHCARE COST**
- **AGED > 60YEARS > 25% MANY COUNTRIES**
- **DEGENERATIVE DISEASES: Obesity, diabetes, stroke, heart attacks, cancer, hypertension, high cholesterol,**
- **Mental performance: memory, learning, processing speed deteriorate with age**
- **Slow compromised healing.**
- **man hours loss; Ageing Population growth, suffering, care-givers time /energy**

Diseases related to diet & lifestyle

*hypercholesterol,
 *dyslipidemia,
 *Atherosclerosis,
 *obesity,
 *chronic oxidative stress,
 *thyroid problems,
 *goitre
 *cardiovascular disease,
 *slow wound healing,
 *certain cancers.



*Hypertension,
 *diabetes,
 *anaemia,
 *gastro-intestinal disorders,
 *metabolic syndrome,
 *brain functions
 *osteoporosis
 *other ailments related to or
 caused by the above
 conditions.

*MANY DISEASES HAVE INTER-RELATED CAUSES

Approach

- POTENTIAL CONVERSION OF UNWANTED AGRO-WASTE INTO HEALTH PRODUCTS
- Affordable
- ENSURE safety (low toxicity)
- Natural
- Scientifically researched



What is metabolic syndrome?

Increased risk to CVD:

At least three of the following:^[27]

- ▶ **Obesity:** waist circumference \geq 102 cm or 40 inches (male), \geq 88 cm or 36 inches (female)
- ▶ **High blood pressure** \geq 130/85 mmHg
- ▶ **Diabetic:** fasting plasma glucose \geq 6.1 mmol/L (110 mg/dl)
- ▶ **dyslipidaemia:** TG \geq 1.695 mmol/L (150 mg/dl)
- ▶ HDL-C $<$ 40 mg/dL (male), $<$ 50 mg/dL (female)
- ▶ **hypercholesterol**

Metabolic syndrome (Syndrome X)

- Central obesity
- High blood pressure
- High triglycerides
- Low HDL-cholesterol
- Insulin resistance



PROBLEM 1: OBESITY & CARDIOVASCULAR AILMENTS

- **Global NEEDS:** Reduce oil intake through fried food to reduce obesity, cardiovascular diseases & cancer
- **SOLUTION:** Provide a botanical extract antioxidant additive that reduces oil absorption in fried food by up to 85%, increase oil stability, food quality & other health benefits
- **BENEFITS:** Health benefits (reduce CardiovascularD, cancer, obesity) , prolong oil & food shelf life, generate Malaysian economy
- **COMPETITORS:** no direct competitor. US, European, Malaysian & Singapore Patent Granted **US 8425969 B2**, PT/2630, WO2009075558. MY20072213).



Problem :

☀Fried foods are high in fat, (up to 50% of food weight), hence calorie dense & contribute to obesity, cancer, cardiovascular & related health problems.

☀Most market oil additives are synthetics, & may cause harmful effects in excess, but allowed within limits because they are effective & cheap.

☀Fried food & frying oil readily undergo oxidation, hydrolysis & rancidity that affect food quality.

**UNOILEY**

A Novel Frying Oil Additive for Global Market

REDUCE OIL ABSORPTION IN FRIED FOOD

- (i) REDUCE FAT DETERIORATION; &**
- (ii) HAVE HEALTH BENEFITS**

Usefulness and Application
UNOILEY

- Biophenol additive for frying oils. Reduces oil absorption in fried food, antioxidative and good for general health.
- Prevent fat deterioration, food wastage, improve crispiness, taste, and quality of fried food reduce oiliness helps maintain good body lipid level.

Innovation novelty invention
UNOILEY

Problem Statement

Most market oil additives are synthetics, and may cause harmful effects in excess, but allowed within legal limits in because they are effective and cheap.

Fried food are high in fat, (up to 50% of food weight), calorie dense and contribute to obesity and related health problem.

Fried food and frying oil readily undergo oxidation, hydrolysis and rancidity that affect food quality.

Plant-derived natural compounds lack molecular composition, understanding, active compounds standardisation, and toxicity data but confer various health benefits.

How UNOILEY works

- Reduce oil absorption in fried food by up to 85%.
- Prevent fat deterioration and conferring health benefits.
- Antioxidative
- Frying oil can be use repeatedly to reduce wastage.
- Reduce oil consumed in the frying process.
- Improve crispiness, taste, and quality of fried food.
- Help to maintain healthy body and blood lipids levels

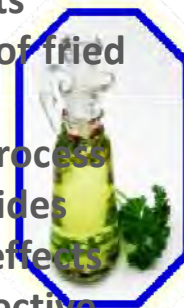
Sample of oil content




Conclusion:
Fried food is less oily, less wastage, less oil consumption, and better health benefits.

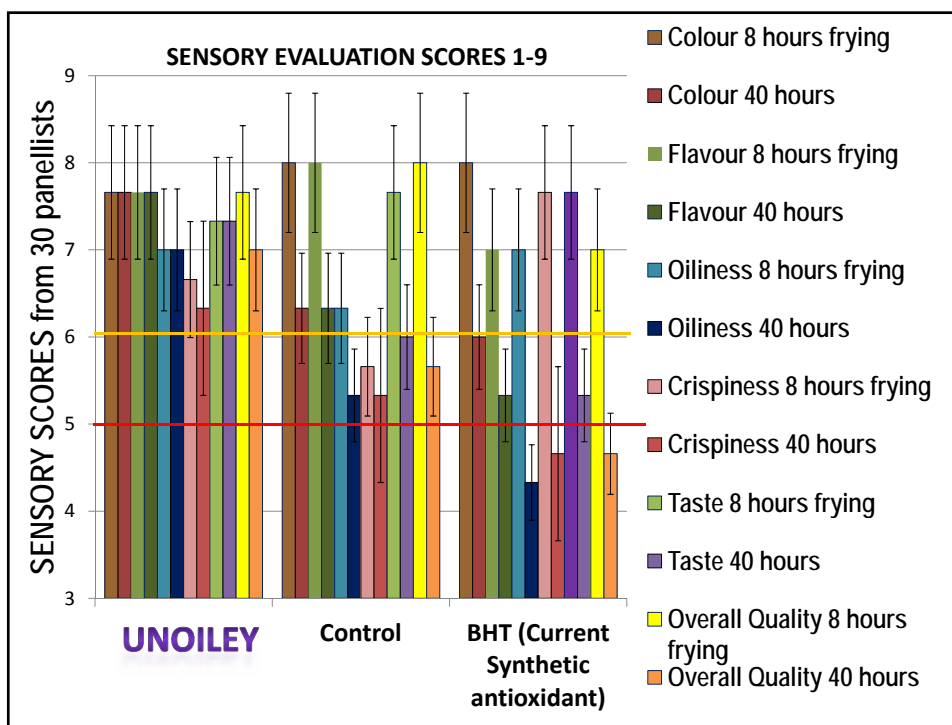
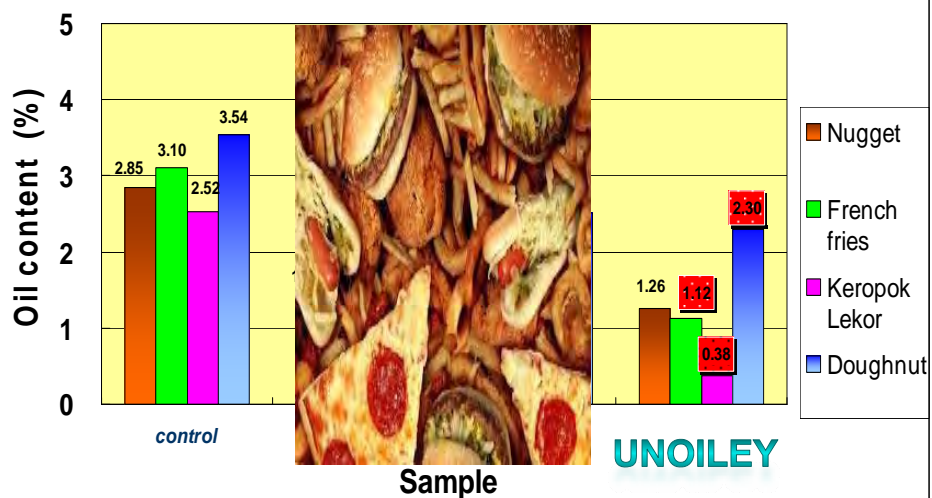
How UNOILEY works

- ☀ Reduce oil absorption in fried food by up to 85%
- ☀ antioxidative
- ☀ Prevent fat deterioration during frying /storage
- ☀ Antibacterial & anti-histamine effects
- ☀ Improve crispiness, taste & quality of fried food
- ☀ Reduce oil consumed in the frying process
- ☀ Reduce blood cholesterol & triglycerides
- ☀ Anti-hypertensive & antispasmodic effects
- ☀ anti-tumor promoters & cancer protective

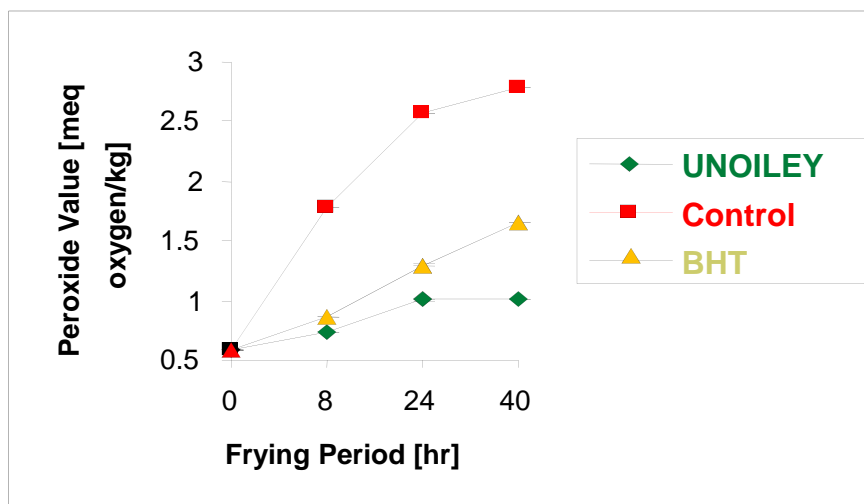


UP TO 85% REDUCTION IN OIL ABSORPTION

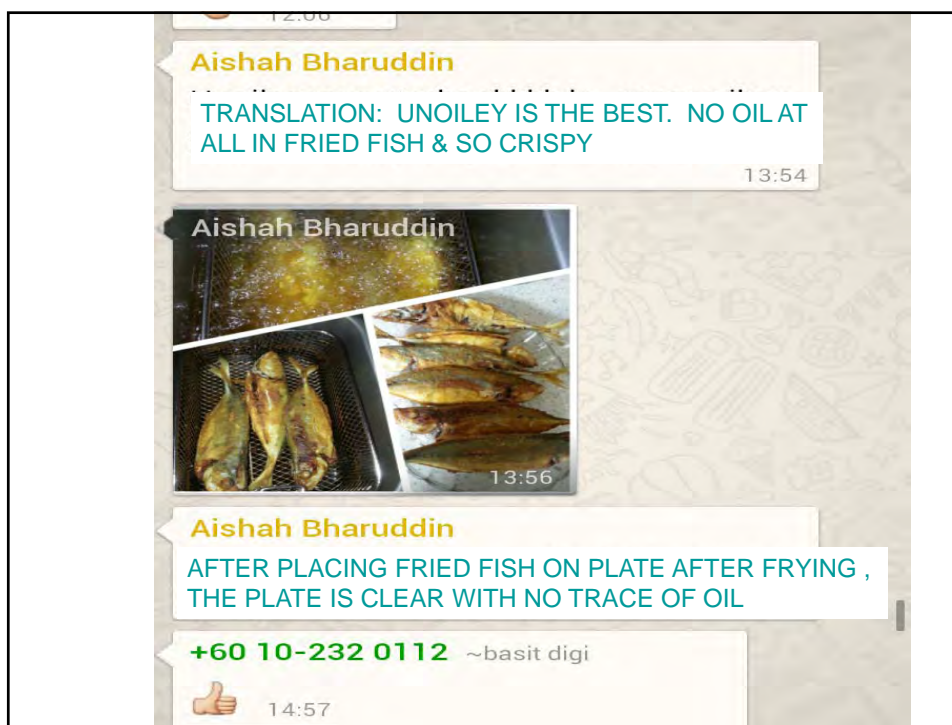
The Oil Content of the Sample (%)



Stability: Peroxide value (primary lipid oxidation products), reduced by 65%




13



PROBLEMS 2: HIGH SALT INTAKE: HYPERTENSION & KIDNEY DAMAGE

- **Global NEEDS:** Reduce salt intake
- **SOLUTION:** Provide a nutritious Low Natrium Hi Calcium seasoning / flavour enhancer /salt replacer & help normalise cholesterol, blood pressure, blood sugar, & body weight.
- **BENEFITS:** Improve Health (reduce CardiovascularD, cancer, obesity), generate economy
- **COMPETITORS:** KCl (bitter after taste & toxic in excess).





MYIPO & IENNA GOLD AWARD

KardioMate:
a nutritious Low Natrium Hi Calcium seasoning / flavour enhancer /salt replacer

The National Academy of Science Food & Nutrition Board recommends:
adults consume not more than 1.5g Na /day.
The average man consumes more than 4g /day.

KardioMate : from tropical marine & terrestrial plants which enhances the flavour & taste of food, have high antioxidant properties, relatively low in sodium, rich in dietary fibre & in other important minerals (Mg, Ca, K, I, Fe, Zn, Cu, Se) & have other health benefits scientifically proven in animal studies.

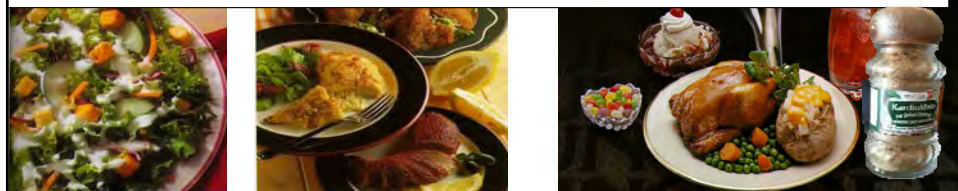
16

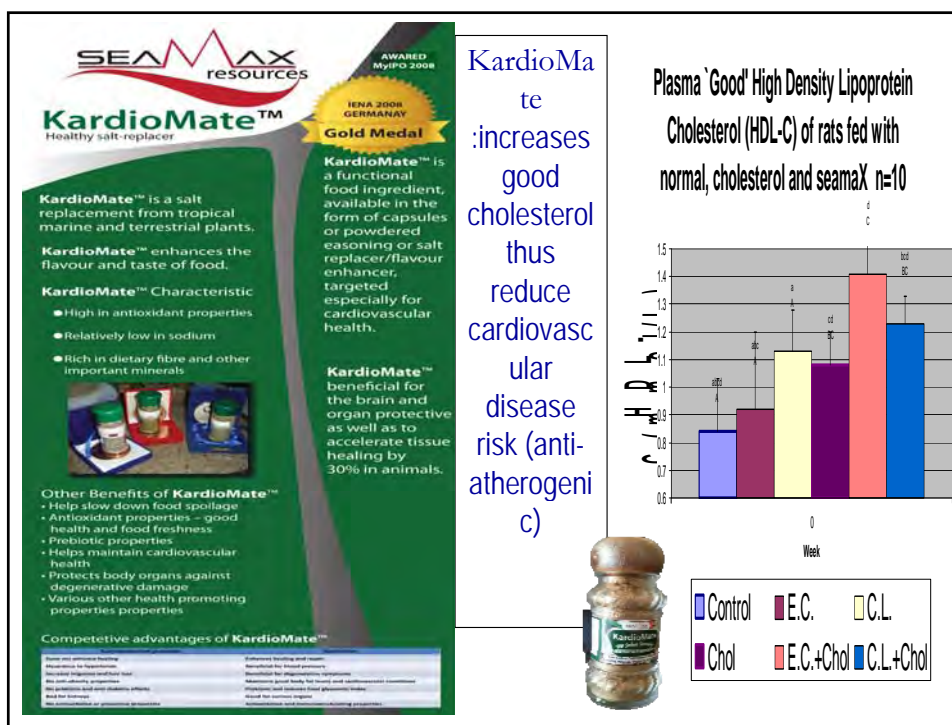
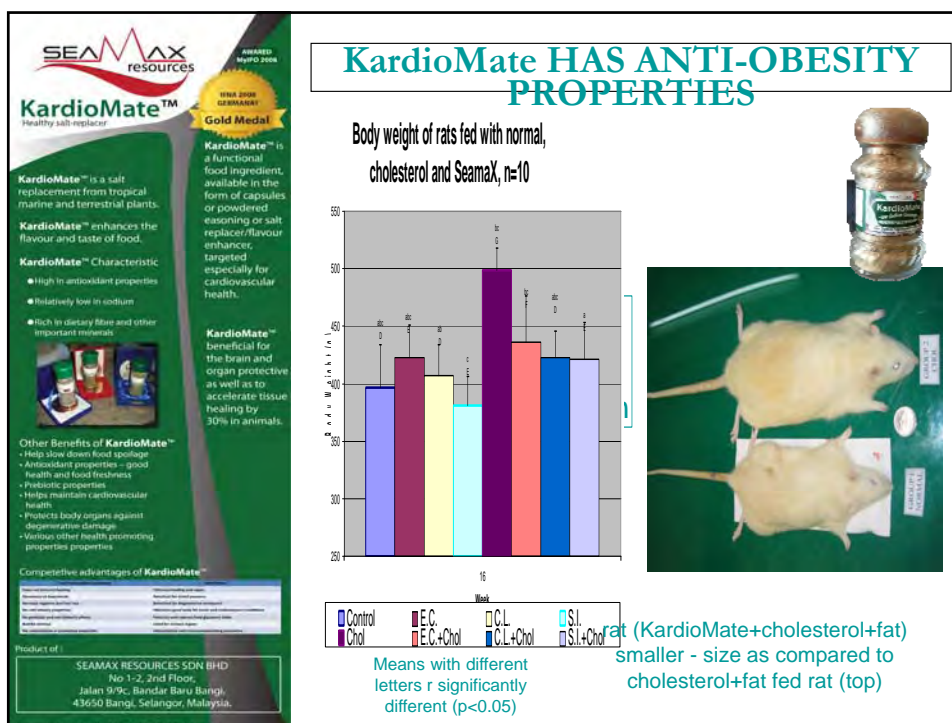
RAW MATERIALS: SEaweeds





KardioMate serving suggestions

Product range: seasoning, sauce, snacks,
ice-cream, drinks,
mono sodium glutamate-replacer, tablets;
powdered cheese replacer; salt /soy sauce
replacer
Can be used in any type of cuisine /food
/culinary






Competitors Product Disadvantages		
Salt / Monosodium glutamate	KardioMate	
✦ does not enhance healing	✦ Enhances organ healing & repair	
✦ hazardous to hypertensic	✦ good for hypertensics	
✦ cause chinese restaurant syndrome	✦ beneficial for degenerative ailments	
✦ no anti-obesity properties	✦ reduces body fat & reduce CVD risks	
✦ no prebiotic or anti-diabetic effects	✦ prebiotic or anti-diabetic effects	
✦ bad for kidneys	✦ good for kidneys & other organs	
✦ no antioxidative nor anti cancer properties	✦ antioxidative & anti cancer properties	



KardioMate-
THE TASTE OF GOOD HEALTH

NUTRITIONAL INFORMATION:

High-soluble dietary fibres (25-75% dry wt);
 High protein (~10%);
 Low Fat (<0.5%), Ω-3 fatty acids;
Minerals (~50%) (mg/100g) Mg ~ 94 – 435; Ca ~ 123 – 681; K ~ 1.2 – 1.75; Fe ~ 20 – 73; Na ~ 45 – 100, Iodine



PROBLEMS 3: COGNITIVE DECLINE POOR MEMORY, SLOW LEARNING

- **Global NEEDS:** Improve mental performance, memory, learning and processing speed
- **SOLUTION:** Provide EDIBLE botanical extract antioxidant that improve Brain function & help normalise cholesterol, blood pressure, blood sugar, & antioxidative
- **BENEFITS:** Improve cognition Health benefits (reduce CardiovascularD, cancer, obesity) , generate economy
- **COMPETITORS:** Other herbs, ginkgo biloba, Centella asiatica etc.



LEAF EXT – HEALTH INGREDIENT /PRODUCTS FROM PALM LEAVES



Waste to wealth: National Innovation award 2009

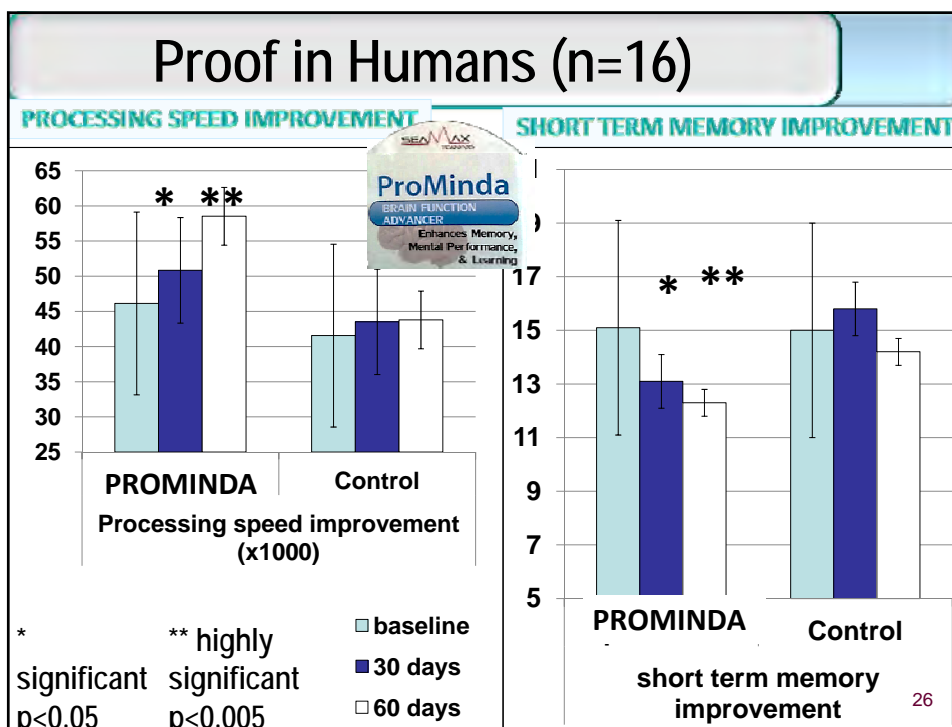
- Malaysia palm industry produces > 30 million T biomass /year, mostly as palm fronds.
 - Our previous work showed that the total polyphenols content in PALM LEAF is more than green tea, has vasorelaxation & strong LDL antioxidant properties

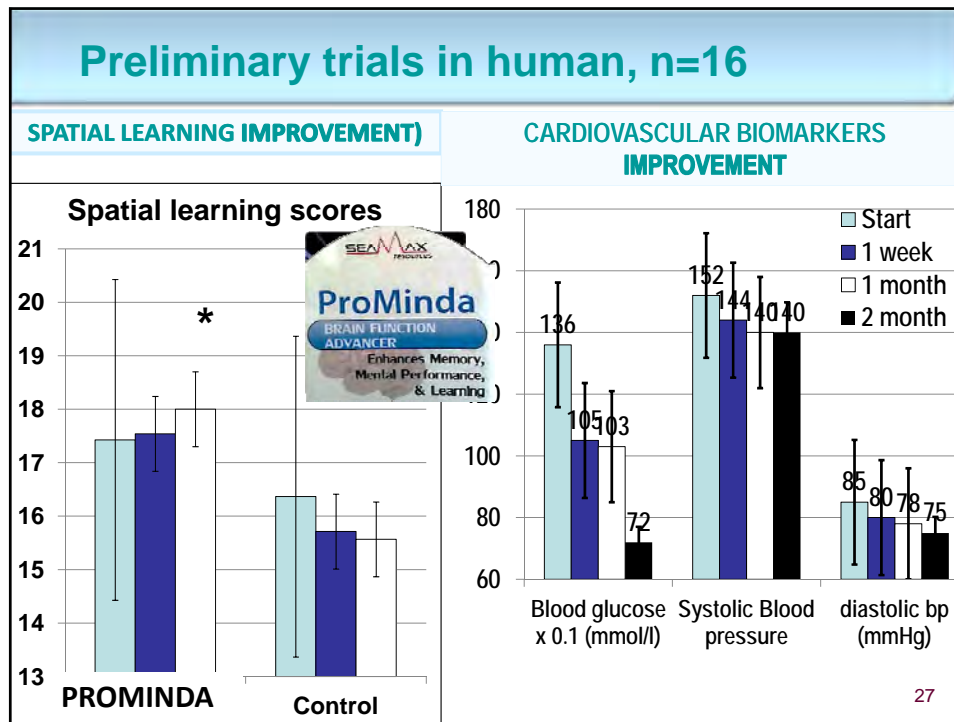
LEAF EXT – HEALTH INGREDIENT /PRODUCTS FROM PALM LEAVES



LEAF EXT ARE SCIENTIFICALLY PROVEN IIN ANIMAL STUDIES TO PREVENT & IMPROVE:

hypercholesterol, hyperlipidemia,
atherosclerosis, oxidative stress,
organ damage, cardiovascular
health, hypertension, diabetes,
Wound healing, fertility, brain
functions & other related conditions





HDL : protects from cardiovascular disease, & mental process.

In Elderly - good cognitive/ mental function
high good HDL-cholesterol levels

Statins: will generally lower LDL-cholesterol, but will not increase HDL-C.

Statins side effects: cause muscle weakness

PROMINDA: can lower LDL & increase HDL-C.

ProMinda™

Enhances Cognition, Enhance Memory, Mental Performance, Processing Speed & Learning

ProMinda™ will improve brain functions, learning, memory and processing speed of brain.

Neuron loss were greatly reduced by ProMinda™

Processing speed, short term memory, and spatial learning were effectively improved in young healthy adults by ProMinda™

Enhance productivity and quality of life

ProMinda™ Advantages

Help reduce healthcare cost, time and energy.

Evaluate the effectiveness of KardloMind/ Prominda on neurons and brain cognitive functions in

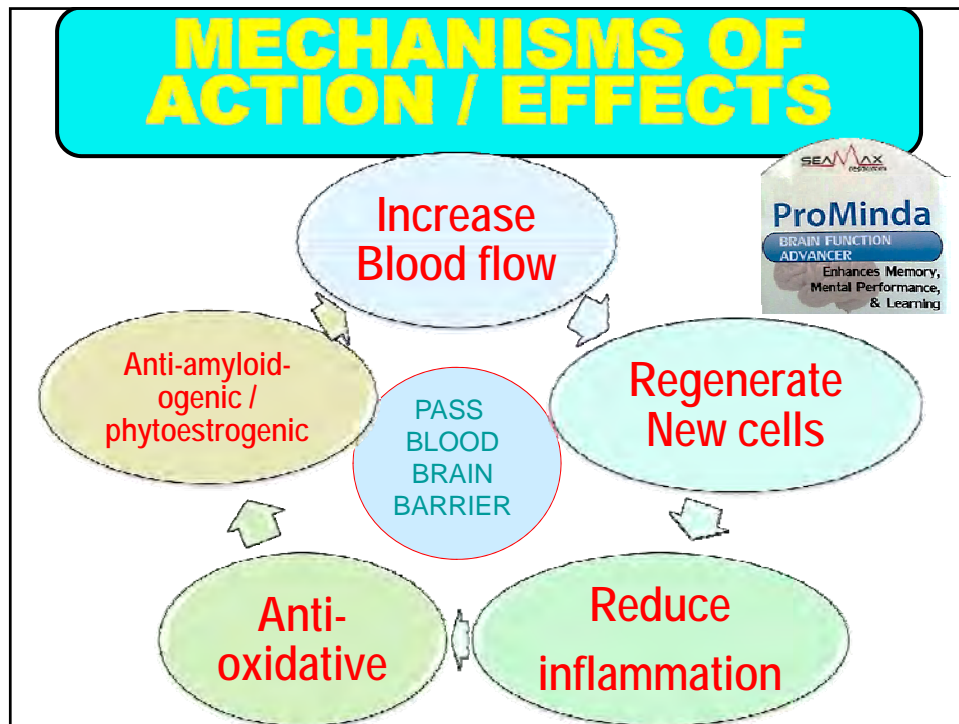
- Human adult
- Nitric oxide deficient rats,

IMPROVE SPATIAL LEARNING

Human learning control

IMPROVE SHORT TERM MEMORY IN HUMANS

Human memory control



PROBLEM 4: bone fractures


- **Global NEEDS:** Reduce bone fractures, osteoporosis, & improve bone strength & joint health
- **SOLUTION:** Provide a affordable botanical extract antioxidant to increase bone mineral density & other health benefits
- **BENEFITS:** increase bone mineral density & generate economy
- **COMPETITORS:** galactosamine, chondroitin sulphate



BONEX

BONE DENSITY ENHANCER

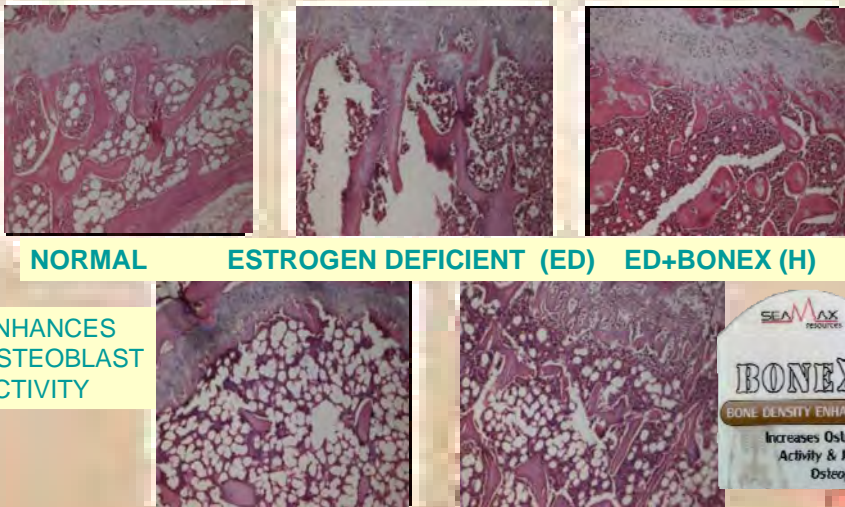
BONEX is a dietary supplement for increasing bone mineral density and prevent bone loss, even in post menopausal women.
BONEX increase osteoblast activity (bone formation)



A: Normal rats B: OVX+ BONEX(H) C: OVX

Phytoestrogenic **BONEX** suppressed bone loss caused by estrogen deficiency, and enhanced bone calcium content.
BONEX is an effective alternative or complementary agent to ERT for maintenance of pre and postmenopausal bone mass in the protection against bone loss


Bone architecture of the femur after 3 months supplementation with BONEX™



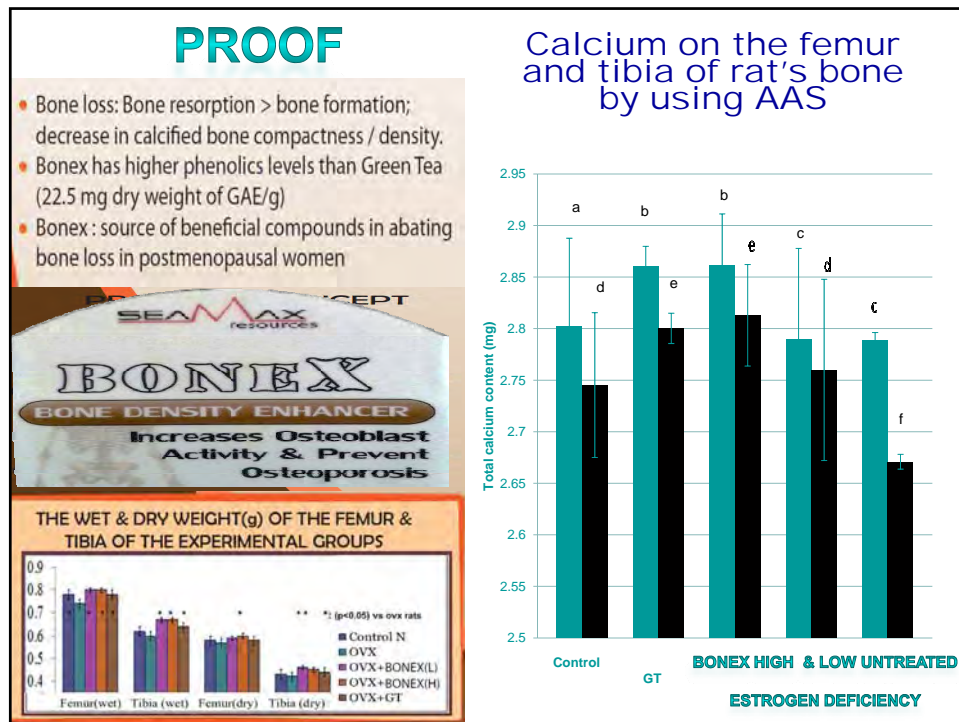
NORMAL ESTROGEN DEFICIENT (ED) ED+BONEX (H)

ED+GREEN TEA ED+BONEX (L)

ENHANCES OSTEOBLAST ACTIVITY



BONEX
BONE DENSITY ENHANCER
Increases Osteoblast Activity & Prevent Osteoporosis



PROBLEM 5: INSUFFICIENT MILK

- **Global NEEDS:** Increase milk production for nursing mothers and ruminants; **BREAST FEEDING IS HIGHLY BENEFICIAL FOR PHYSICAL & MENTAL HEALTH OF BABY & MOTHER**
- **SOLUTION:** Provide a affordable botanical extract antioxidant to increase milk output & improve breast health (to prevent cancer)
- **BENEFITS:** increase milk output for mother and baby's health & improve family economy
- **COMPETITORS:** baby's formulae (**EXPENSIVE & INCOMPLETE**)

Awarded Women Bio-Innovation

PromoLaktin™

Milk Production Booster

PromoLaktin is a milk-production enhancer dietary supplement, from marine flora.

PromoLaktin is a complementary agent to good nutrition for increasing milk volume in human and animals, and for breast ailment protection

SEAMAX resources

BioMalaysia 2012 Gold Medal

Awarded Women Bio-Innovation

PromoLaktin™
Milk Production Booster

PromoLaktin is a milk-production enhancer dietary supplement, from anti-estrogenic flora.

PromoLaktin is a complementary agent to good nutrition for increasing milk volume in human and animals, and for breast ailment protection.

PromoLaktin Advantages

- Potential lower production costs
- Ease of use
- Product

PromoLaktin is anti-oxidative, nutritious and is non-toxic at the normal dose.

Breast-feeding is highly beneficial for the physical and mental health of both the baby and mother.

PromoLaktin reduces tissue lipid oxidation marker (Malondialdehyde) and increases GSH (endogenous antioxidant).

Doubles expression	milk /pump	Milk (g) expressed
Month	1	4
Control untreated	50 g	100g
With Promolaktin	0.5-5g	100g 200g

Promolaktin dose-dependently increased the estrus phase duration (during which ovulation occur).

PromoLaktin mechanism
Reduces Serum estradiol

Lactation enhancing activities of Promolaktin were evaluated in nursing mothers at 0.5-5g /day doses. Mothers of babies below 6 months were able to pump out twice the normal milk production for their babies, almost immediate or within the same day of consumption.

PromoLaktin
MILK PRODUCTION ENHANCER
Rich with Essential Minerals, Protein & Anti-oxidant

Double Milk Expression



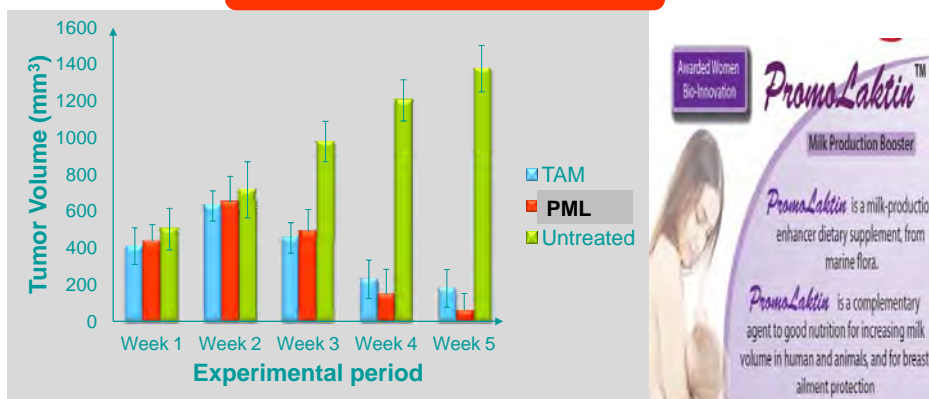
PROMOLAKTIN: CAN KILL HUMAN BREAST CANCER CELLS & INCREASE IMMUNITY (IN ANIMAL STUDIES)

PromoLaktin™
Milk Production Booster

PromoLaktin is a milk production enhancer dietary supplement, from marine flora.

PromoLaktin is a complementary agent to good nutrition for increasing milk volume in human and animals, and for breast ailment protection.

Tumor Volume Size



❖ Tumor Growth

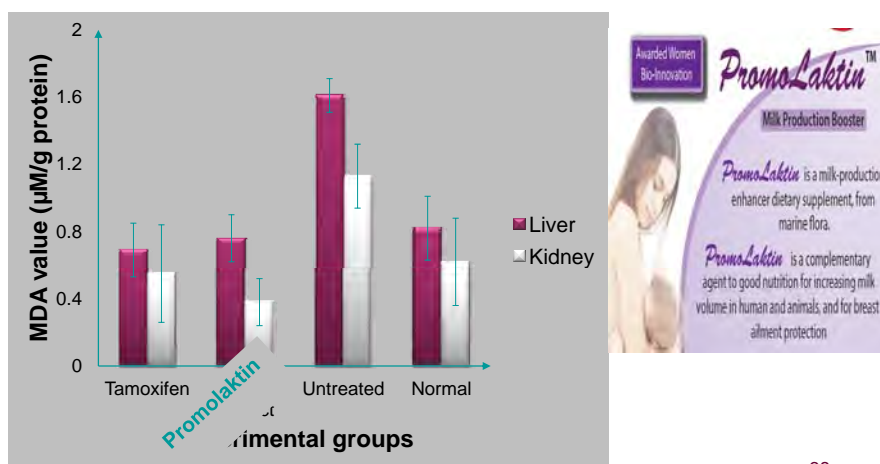
Significant increase in untreated group in week 3, 4 & 5 (92%)

Significant reduction in TAM (71%) & PML (91%) treatment

PML: PROMOLAKTIN; TAM: tamoxifen

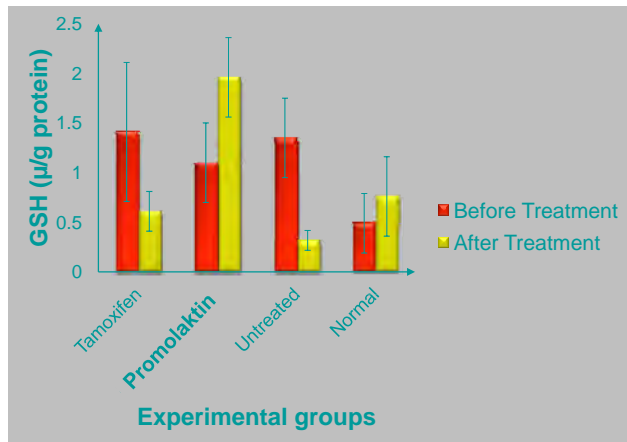
37

REDUCE Tissue lipid oxidation MDA Value :Malondialdehyde: OXIDATION marker)



38

INCREASE ENDOGENOUS ANTIOXIDANT : Reduced Glutathione:



39

PROBLEM 6: SKIN INJURY/ INFECTION

- **Global NEEDS:** ENHANCE tissue and skin healing after injury or surgery (especially for diabetics)
- **SOLUTION:** Provide an affordable non toxic (edible) botanical extract antioxidant to increase skin healing
- **BENEFITS:** reduce morbidity & mortality, prevent amputation (e.g in diabetics)



Healen™ :

A tissue healing enhancer,
from edible plants - for
chronic wounds.

*accelerates healing :esp
for compromised healing
patients (diabetics, surgery
or accident patients). -
used topically, ~30% faster
healing.

* accelerates wound
contraction, reduced
inflammation & immune
modulation.

*plants used possess
cardiovascular protective
properties, liver & kidney
protective.

SEAMAX
resources

Introducing
First-aid kit in a Tube
Soothes the wound with vaporub properties

Healen
ANTISEPTIC
WOUND HEALING ENHANCER

Healen™ is effective on
chronic wounds. Significantly
enhance healing and non-
toxic drugs.

Healen™ is a tissue healing
enhancer from plant
that accelerates
healing, especially in
compromised patients.

• Reduce the time required to heal
wounds by 50%

• Formulated to improve tissue
regeneration and immune/
inflammatory response to
enhance healing.

• Promotes healing of sores, cuts,
scrapes, rashes, and various skin
ailments/ injuries.

• Non-toxic and safe for regular use.
This biophenolic balm prevent microbial,
fungal, mites infection and
soothes the skin

• The formulation may
also encourage hair
growth and
compounds that
enters the
blood stream
benefits the
heart, liver
and kidney

Healen™
The first aid Balm
A natural Biophenolic
wound healing ointment
First aid ointment/spray

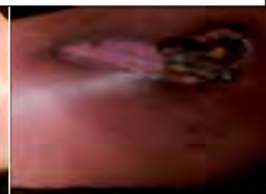


Healen from edible plants for Wound treatment

Before: diabetic healing resistant
wound



After 1 month



Before: Normal rats with excision
wound



Negative control rats after 15
days



Product treated rats after 15
days (note hair growth
effects)



lion pictures

42

www.seamaxresources.com

SEAMAX resources

ProMinda™

Enhances Cognition, Enhance Memory, Mental Performance, Processing Speed & Learning.

ProMinda™ will improve brain functions, learning, memory and processing speed of brain.

Neuron loss were greatly reduced by ProMinda™

Processing speed, short term memory, and spatial learning were effectively improved in young healthy adults by ProMinda™

Enhance productivity and quality of life

ProMinda™ Advantages

Help reduce healthcare cost, time and energy.

Product of: SEAMAX RESOURCES SDN BHD
No 1-2, 2nd Floor, Jalan 9/9c, Bandar Baru Bangi,
#SEEN D'East Cyberjaya, Malaysia

www.seamaxresources.com

SEAMAX resources

UNIOLEY

Oil absorption reducer additive

Usefulness and Application

- Biophase additive for frying oils. Reduces oil absorption in fried food.
- Antioxidative and good for human health.
- Prevents fat deterioration & oil wastage.
- Improves crispiness, taste, and quality of fried food.
- Reduces oil cost.
- Helps maintain good body lipid level.

Innovation: novelty & inventiveness

UNIOLEY

- Most market oil additives are synthetic, and may cause harmful effects in excess, but allowed within legal limits because they are effective and cheap.
- Fried food are high in fat, up to 50% of food weight, hence calorie dense and contribute to obesity and related health problems.
- Fried food and frying oil readily undergo oxidation, hydrolysis and rancidity that affect food quality.
- Plant-derived natural antioxidants: active compounds standardization, and toxicity data but confer various health benefits.

How UNIOLEY works:

- Reduces oil absorption in fried food by up to 85%.
- Prevents fat deterioration and centering health benefits.
- Antioxidative.
- Frying oil can be used repeatedly to reduce wastage.
- Reduces oil consumed in the frying process.
- Improves crispiness, taste, and quality of fried food.
- Helps to maintain healthy body and blood lipid levels.

Product of: SEAMAX RESOURCES SDN BHD

www.seamaxresources.com

SEAMAX resources

PromoLaktin™

Milk Production Booster

PromoLaktin™ is a milk-production enhancer dietary supplement from marine flora.

PromoLaktin™ is a complementary agent to good nutrition for increasing milk volume in human and animals, and for breast ailment protection.

PromoLaktin Advantages

- Potential lower production costs.
- dairy products.
- Ease of use.
- Product.

PromoLaktin™ is anti-oxidative, nutritious and is non-toxic at the normal dose.

Breast-feeding is highly beneficial for the physical and mental health of both the baby and mother.

PromoLaktin mechanism:

Reduces serum estradiol

Lactation enhancing activities of Promolaktin were evaluated in nursing mothers at 0.5-5g/day doses. Mothers of babies below 6 months were able to pump out twice the normal milk production for their babies, almost immediately or within the same day of consumption.

Product of: SEAMAX RESOURCES SDN BHD

www.seamaxresources.com

SEAMAX resources

BONEX

BONE DENSITY ENHANCER

BONEX is a dietary supplement for increasing bone mineral density and prevent bone loss, especially postmenopausal women.

- Bone loss: Bone resorption > bone formation; decrease in calcium bone compactness / density.
- Bonex has higher phenolics levels than Green Tea (22.5 mg dry weight of GAE/g).
- Bonex: source of beneficial compounds in abating bone loss in postmenopausal women.

PROOF OF CONCEPT

THE WET & DRY WEIGHT(S) OF THE FEMUR & TIBIA OF THE EXPERIMENTAL GROUPS

Phytoestrogenic BONEX suppressed bone loss caused by estrogen deficiency and enhanced bone calcium content. BONEX is an effective alternative or complementary agent to ERT for maintenance of pre and postmenopausal bone mass in the protection against bone loss.

Product of: SEAMAX RESOURCES SDN BHD

www.seamaxresources.com

SEAMAX resources

Introducing

First-aid kit in a Tube

Soothes skin injury with vaporub properties

Healen

ANTISEPTIC SKIN HEALING ENHANCER

Healen™ is effective on chronic skin injury. Significantly enhances healing and non toxic.

- Reduces the time required to heal skin injury by 50%.
- Formulated to improve tissue regeneration and (immune)/ inflammatory response to enhance healing.
- Promotes healing of sores, cuts, scrapes, rashes, and various skin ailments/ injuries.
- The formulation may also encourage hair growth and compounds that enters the blood stream benefits the heart, liver and kidneys.
- Non-toxic and safe for regular use. This bio-phenolic balm prevents microbial, fungal, mites infection and soothes the skin.

Healen™
The first aid balm
A natural Bio-phenolic skin injury healing ointment
First aid ointment/surgery

Product of: SEAMAX RESOURCES SDN BHD

www.seamaxresources.com

SEAMAX resources

KardioMate™

Healthy salt-replacer

KardioMate™ is a salt replacement from tropical marine and terrestrial plants.

KardioMate™ enhances the flavour and taste of food.

KardioMate™ Characteristic

- High in antioxidant properties
- Relatively low in sodium
- Rich in dietary fibre and other important minerals

Other Benefits of KardioMate™

- Helps slow down food spoilage
- Antioxidant properties – good health and food freshness
- Prebiotic properties
- Helps maintain cardiovascular health
- Protects body organs against degenerative damage
- Various other health promoting properties

KardioMate™ is a functional food ingredient, available in the form of capsules or powdered seasoning or salt replacer/flavour enhancer, targeted especially for cardiovascular health.

KardioMate™ beneficial for the brain and organ protective as well as to accelerate tissue healing by 30% in animals.

Product of: SEAMAX RESOURCES SDN BHD

SOME PATENTS FILED ON FUNCTIONAL FOOD

(No)	Tajuk Paten / Produk , (<i>Patent title / product</i>)	No IP (<i>IP No</i>)
2	Low Sodium, High Calcium, Protein Hydrolysate Flavor Enhancer & A Method Prepare Thereof - for hypertension and kidney patients	MY 20064780, 20061228, P2094111 (A1), 2008082286 (A1), US2009317510 (A1), GRANTED
3	Extract From Palm Leaves & A Method For Producing The Same – against cardiovascular disease -hypertension	MY 20071111, 20070711, WO2009008697-A4, EP2170105 A1,
4	Flavour Enhancers / Food Seasoning From Seaweeds & A Method For Producing Thereof – for general health	MY 20071208 20070725, WO2009051470 (A8)
5	An Additive For Edible Oil Composition – that reduce oil absorption by up to 85% in fried food with antioxidant properties and other health benefits	MY20072213 20071211, WO2009075558 (A1) GRANTED

45

PATENTS FILED

A Composition For Wound Healing	PI20083894
Anti-cancer Nutraceutical Composition GRANTED	PI20085284, WO2010/074553 A1
Use Of A Neuroprotective Extract & Pharmaceutical Preparation Thereof	PI20090964
Antidiabetic Nutraceutical Composition	PCTMY2009000041
A Phytoestrogenic Nutraceutical Composition From Palm Leaf Extract	PCTMY2009000040
A Composition For Enhancing Hair Growth	PI20094850
Composition For Promoting Lactation With Tumour Suppressive Properties And Preparation Method Thereof	PI 2011000290
Extract Of Palm Leaf And A Composition Comprising The Same For Increasing Bone Mineral Density And Arterial Homeostasis	PI2011005992
Composition For Modulating Immune System and Preparation Method Thereof	PI2012003493
Composition For Enhancing Athletic Endurance And Performance	PI2013701127

46