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Health Tips

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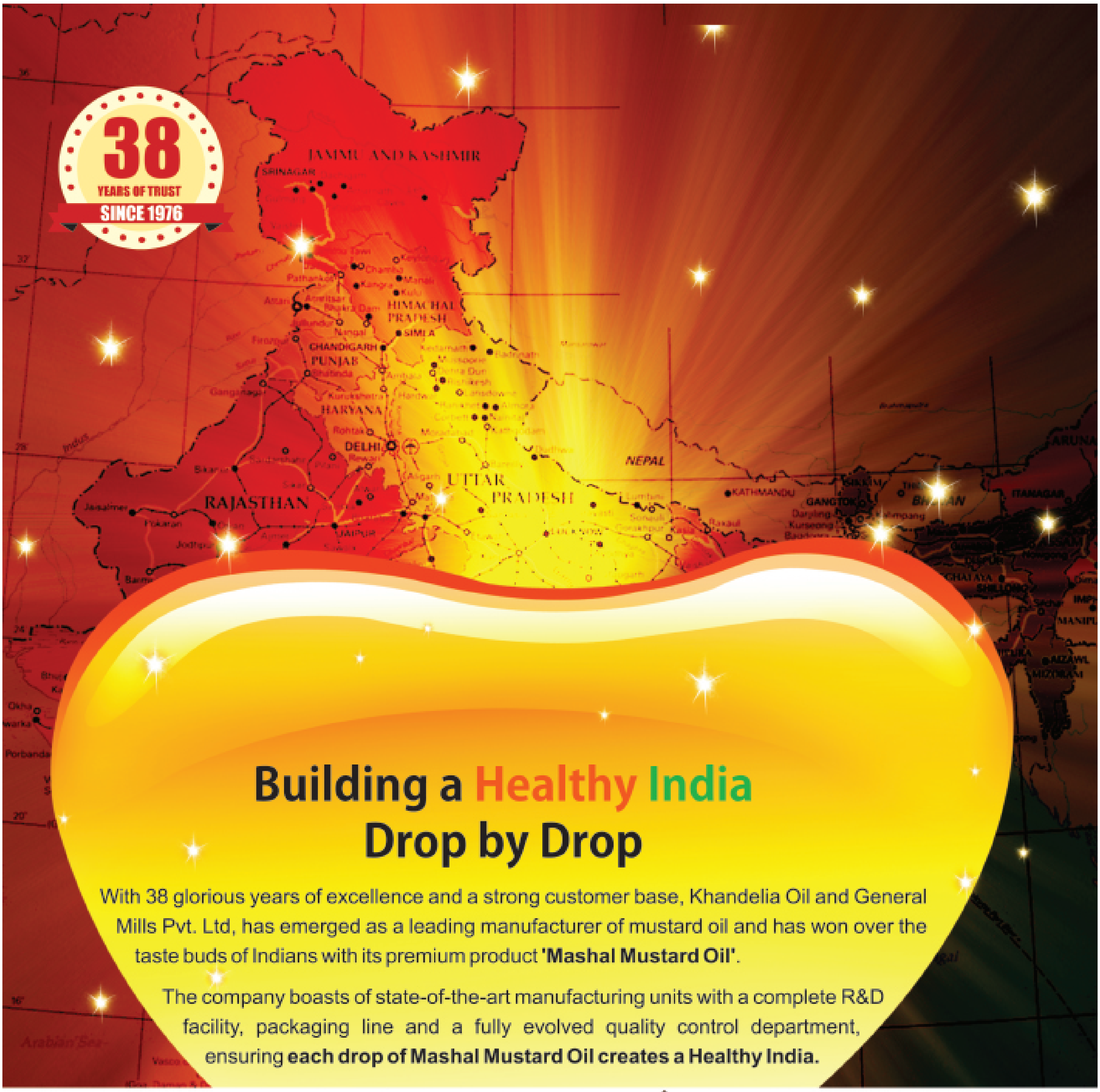

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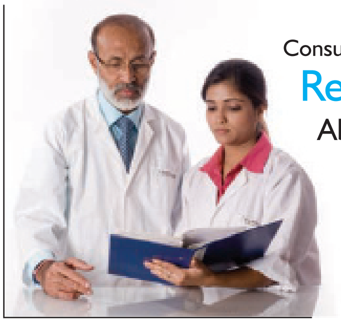

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Editor's desk

The slow start of monsoon is expected to have adverse affect on the production of oil seeds. India produced a record 32.4 million tonnes of oilseeds in the crop year ended June. Due to monsoon it is expected that the oil seed production will fall by 6-7 % in this year. Late and weak start of monsoon also affected sowing of main oilseed crop of the season i.e. soybean and only 4,45,000 hectares planted in last month against plantation of 4.3 million hectares last year.

The oil seed producing area in India are highly dependent on the monsoon. The oil seed production fluctuates with rain. While the consumption of oil increasing 3-4 % annually, the growth of production is restricted to 1-1.5%. . The judicious use of HYV oil seed, fertilizers, and irrigation can change the scenario. Higher oil seed production will not only save valuable foreign exchange but provide employment to Lacs of people associated with the oil and oilseed sector.

Further integration in the form of protein isolates from DOC and recovery of micronutrients from oil, oil seed and its product will ensure profitability in oil operations. The government can take lead by making long term policy for achieving self reliance in the field of edible oil and allied products.

Yours truly

C S Joshi, Editor

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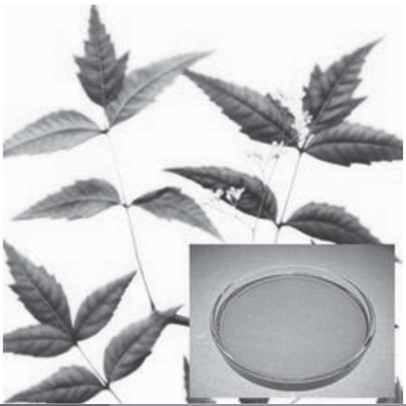

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Effect of Lowering the Glycemic Load with Canola Oil

on Glycemic Control and Cardiovascular Risk Factors: A Randomized Controlled Trial

Abstract

OBJECTIVE: Despite their independent cardiovascular disease (CVD) advantages, effects of a-linolenic acid (ALA), monounsaturated fatty acid (MUFA), and low-glycemic-load (GL) diets have not been assessed in combination. We therefore determined the combined effect of ALA, MUFA, and low GL on glycemic control and CVD risk factors in type 2 diabetes.

RESEARCH DESIGN AND METHODS: The study was a parallel design, randomized trial wherein each 3-month treatment was conducted in a Canadian academic center between March 2011 and September 2012 and involved 141 participants with type 2 diabetes (HbA1c 6.5%–8.5% [48–69 mmol/mol]) treated with oral antihyperglycemic agents. Participants were provided with dietary advice on either a low-GL diet with ALA and MUFA given as a canola oil–enriched bread supplement (31 g canola oil per 2,000 kcal) (test) or a whole-grain diet with a whole-wheat bread supplement (control). The primary outcome was HbA1c change. Secondary outcomes included calculated Framingham CVD risk score and reactive hyperemia index (RHI) ratio.

RESULTS: Seventy-nine percent of the test group and 90% of the control group completed the trial. The test diet reduction in HbA1c units of -0.47% (-5.15 mmol/mol) (95% CI -0.54% to -0.40% [-5.92 to -4.38 mmol/mol]) was greater than that for the control diet (-0.31% [-3.44 mmol/mol] [95% CI -0.38% to -0.25% (-4.17 to -2.71 mmol/mol)], P = 0.002), with the greatest benefit observed in those with higher systolic blood pressure (SBP). Greater reductions were seen in CVD risk score for the test diet, whereas the RHI ratio increased for the control diet.

CONCLUSIONS: A canola oil–enriched low-GL diet improved glycemic control in type 2 diabetes, particularly in participants with raised SBP, whereas whole grains improved vascular reactivity.

Introduction

New pharmacological treatments for diabetes are required to be tested for cardiovascular safety before licensing (1) due to concerns over possible increased cardiovascular disease (CVD) risk in some studies (2). Dietary strategies, although less effective in improving glycemic control, may have the advantage of actually reducing CVD risk (3,4).

Low-glycemic-load (GL) diets have been associated in cohort studies with a reduction in both diabetes incidence and CVD events (3–5), especially in overweight individuals (3), and have been recommended by many diabetes associations (6–8). Monounsaturated fatty acids (MUFAs) and short-chain-length n-3 fatty acids (a-linolenic acid [ALA]) reduced CVD risk in randomized controlled trials (9,10). Furthermore, high ALA and MUFA intake may also lower the GL of the diet. An increased proportion of vegetable oil calories in the meal would be expected to reduce postprandial glycemia both by decreasing the carbohydrate content of the meal and by delaying gastric emptying, whereas the increase in vegetable oil over the longer term would predict a reduction in serum lipids. This combined dietary approach may therefore benefit both glycemia and CVD risk in diabetes. Despite these possible advantages, the effects of ALA and MUFA as part of a low-GL diet have not been tested in type 2 diabetes.

To determine the possible advantages of this combination, we tested the effect of a commonly used oil, canola oil, containing both ALA (9.1%) and MUFA (63%) when used as part of a low–glycemic index (GI) diet. This dietary intervention was compared with a high-whole-grain–cereal diet. Such whole-grain diets have invariably been associated with a reduced risk of diabetes (11,12) and CVD in cohort studies (12–14), despite generally having no effect on conventional CVD risk factors (15).

Research Design and Methods

Participants

Participants were recruited from newspaper, public transportation, and hospital clinic advertisements. One hundred and forty-one participants were eligible and randomized (Fig. 1). Recruitment took place from 28 March 2011 to 17 September 2012, with the last study visit on 4 December 2012. Eligible participants had at least a 6-month history of type 2 diabetes based on clinical criteria, were taking a stable dose of oral antihyperglycemic agents for at least the previous 2 months, and had HbA1c values between 6.5% (48 mmol/mol) and 8.5% (69 mmol/mol) both at the initial screening and at the visit 1 week before randomization (Fig. 1). No participants had clinically significant cardiovascular, renal (creatinine >150 µmol/L), or liver (alanine aminotransferase level more than three times the upper limit of normal) disease or a history of cancer. None were smokers, and alcohol intake was two or fewer drinks a day for men and one or fewer drinks a day for women. Participation rate and reasons for exclusion are given in Fig. 1.

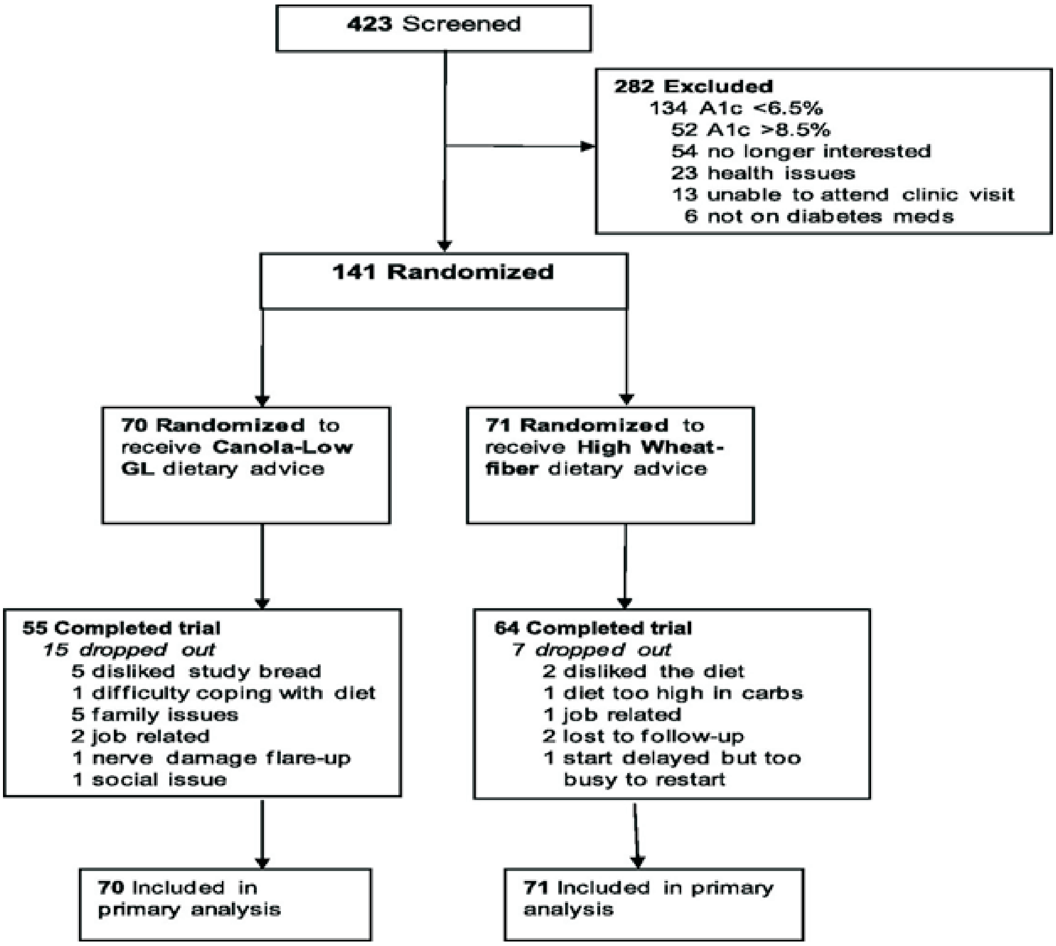


Figure 1 : Flow of participants through the study.

Protocol

The study followed a randomized, parallel design with two treatment arms of 3 months duration as follows: 1) a low-GL diet with a canola oil–enriched bread provided as a supplement (test) or 2) a high wheat-fiber diet emphasizing whole-wheat foods (control). After stratification by sex and HbA1c >7.1% or =7.1% (54 mmol/mol) but without a predetermined block size, participants were randomized in a blinded fashion by a statistician who was geographically separate from the study center. The dietitians and participants could not be blinded, but equal emphasis was placed on the potential importance of both diets for health. The analytical technicians, statistician, and study investigators were blinded to treatment up to and including the analysis of the primary outcome.

Participants attended the Risk Factor Modification Centre of St. Michael's Hospital, a teaching hospital of the University of Toronto, for screening and weeks -1, 0, 2, 4, 8, 10, and 12 of the study. They were weighed at each visit; waist circumference was measured while standing at the level of the umbilicus, and fasting blood samples were taken at all visits except week 2. Seated blood pressure was measured in triplicate with an automatic sphygmomanometer (Omron HEM 907 XL; Omron Healthcare Inc., Burlington, ON, Canada) and the mean taken. Seven-day food records covering the week before each visit were discussed with the dietitian. No specific exercise advice was given, but participants were asked to keep exercise constant. Baseline exercise routine was recorded and any subsequent change noted. The study conformed to the same general principles as other studies of this duration run from the center (16).

The study was approved by the research ethics board of St. Michael's Hospital and the University of Toronto, and written consent was obtained from all participants. The study was registered with ClinicalTrials.gov (identifier:NCT01348568).

Dietary Interventions

The test diet included 4.5 slices of canola oil–enriched whole-wheat bread (500 kcal/day) provided as a supplement. The supplement delivered 31 g canola oil or 14% of total dietary calories of a 2,000-kcal diet

(Supplementary Table 1). The control diet included 7.5 slices of whole-wheat bread without canola oil per day (500 kcal) (Supplementary Table 1). Dietary advice on the test diet emphasized low-GI foods, including legumes, barley, pasta, parboiled rice, and temperate-climate fruit, as outlined in previous studies (17). For the control diet, participants were instructed to avoid white-flour products and replace them with whole-wheat breakfast cereals, study breads, brown rice, and so forth.

Dietary Assessment

Participants provided 7-day food records covering the previous 7 days before clinic visits. These records were discussed with the dietitians for clarification for future formal dietary analyses and to indicate where further dietary advice was required. The different nature of the diets precluded blinding; however, the advantages of both diets were emphasized with reference to their benefits as recorded in the literature (11–14). Adherence to the diet was assessed from the 7-day food records; 106 participants provided complete dietary records for the 3-month study. Participants ranked their level of satiety on a scale of -4 (starved/feeling weak) to +4 (painfully full) and palatability of study breads and diets at each visit on a scale of 1–10 (1 = strongly dislike, 10 = like very much).

Biochemical and Dietary Analyses

HbA1c, blood glucose, and serum lipids were measured in the hospital routine analytical laboratory by techniques as previously described (17). The reactive hyperemia index, as a marker of flow-mediated vasodilatation, was measured with the EndoPAT system (Itamar Medical Ltd., Franklin, MA), which assesses the capillary blood refill to finger tips after a 5-min occlusion of the forearm with a cuff inflated to 50 mmHg above the participant's resting systolic blood pressure and expressed as a ratio of the blood flow in the opposite arm (18). Diet records were analyzed using a computer program (ESHA Food Processor SQL version 10.9; ESHA, Salem, OR) based on U.S. Department of Agriculture data (19) and international GI tables (20) using the bread scale (where bread = 100; for the glucose scale, bread scale values were multiplied by 0.71) (21) (Supplementary Table 1).

Statistical Analyses

Results are expressed as mean ± SEM or 95% CI. Both the absolute and the relative CVD risk score were calculated using the Framingham risk equation for total 10-year cardiovascular events (22), in which only systolic blood pressure and total and HDL cholesterol (HDL-C) changed during the study. All patients who met the inclusion criteria were included in the analysis (n = 141). Week 0 HbA1c was taken as baseline, and weeks 8, 10, and 12 were selected as end of study to allow for stabilization of HbA1c as the main outcome. Treatment differences in physical and biochemical measures were assessed from all available data. The analysis of treatment effect within a repeated-measures study design used the mixed (random-effects) linear model, with change from baseline over time as the response variable and diet (low-GL canola vs. wheat bran) and time (weeks 8, 10, and 12) as the main effects. Neither baseline nor other covariates were used in the primary analysis, which was performed with SAS 9.2 software (23). Within-treatment changes for all variables were estimated by the least squares means technique within the mixed model.

Changes in medication use were assessed either by two-tailed Fisher exact test in the case of 2 × 2 tables or by the Mantel-Haenszel test for larger contingency tables. For the values used in Fig. 2 and associated Supplementary Table 2, multiple imputation using five sets of randomly imputed values for missing data was generated by PROC MI and analyzed by PROC MIXED, and the five sets of results were pooled by PROC MIANALYZE in SAS 9.2 (23).

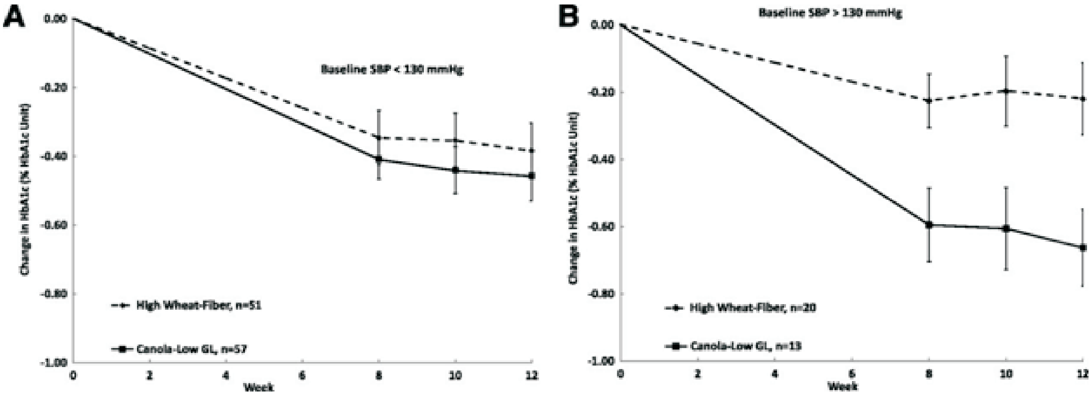


Figure 2 : Changes from baseline in HbA1c (percent absolute HbA1c units) during canola low-GL (test) and high wheat-fiber (control) diets. Diet results in participants with lower (A) or higher baseline systolic blood pressure (SBP) (B) than the metabolic syndrome cut points. HbA1c was reduced more for the test diet than for the control diet in those with higher baseline SBP (P = 0.003).

We also assessed the interactions between the effect of diet on HbA1c and the baseline measures of components of the metabolic syndrome (waist circumference, systolic and diastolic blood pressure, HDL-C, fasting triglyceride level, and blood glucose level) together with the additional components of the Framingham risk score (age, sex, total cholesterol:HDL-C) (Supplementary Table 2). HbA1c response data were stratified according to whether the participants' baseline measures were above (or equal to) or below the cut point for metabolic syndrome components (24) or the median for CVD risk factor components of the Framingham risk score (22). The HbA1c data for upper and lower systolic blood pressure cut points are also presented in graphic form (Fig. 2). The treatment differences between these subgroups and the significance of the interaction with baseline measures (Supplementary Table 2) were calculated for both raw and multiply imputed data. To determine whether any baseline measures affected the HbA1c response by >10% and might thus be considered a modifier of the effect size, we undertook a bivariate regression analysis of HbA1c change (repeated measures) involving baseline measures of predictors suggested by the metabolic syndrome diagnostic criteria (6) and Framingham CVD risk factors (3) by using one predictor at a time.

Initially, we planned to recruit 120 participants. However, because of a larger-than-expected dropout at the start and to capture smaller effect sizes seen in our more-recent studies, participant recruitment numbers were increased to 140 (16,25). On the basis of data from a 12-week study in type 2 diabetes (16) from an ANCOVA model, we would require 116 completers to detect a treatment difference in HbA1c change of 0.15% with an SD of 0.48% [assuming a = 0.05, 1 - ß = 0.8, using r = 0.8 to account for the high degree of correlation between successive measures (26)].

Results

Fifty-five of 70 participants (79%) completed the test diet (i.e., provided at least one blood sample in the final month), compared with 64 of 71 (90%) on the control diet (Fig. 1). Of the 119 participants with data in the last month (completers), 3 on the test diet and 7 on the control diet were missing one or two of the three final values. The attrition rates were not significantly different between treatments (Fig. 1). No baseline differences were seen (Table 1) except for a higher baseline dietary GI in the test group compared with the control group (3 GI units [95% CI 1.1–4.9], P = 0.003) (Supplementary Table 3). The test bread was rated more palatable than the control bread, as was the overall test diet compared with the control diet (Supplementary Table 3).

Table 1
Baseline (week 0) characteristics of study participants

	Participants	
Characteristic*	Control diet (n = 71)	Test diet (n = 70)
Age (years)	59 ± 10	59 ± 10
Sex		
Female	32 (45)	32 (46)
Male	39 (55)	38 (54)
Race/ethnicity		
African	2 (3)	4 (6)
East Indian	13 (18)	21 (30)
European	29 (41)	24 (34)
Far Eastern	8 (11)	4 (6)
Other white/Caucasian	13 (18)	9 (13)
Other	6 (8)	8 (11)
Weight (kg)	84 ± 19	85 ± 20
BMI (kg/m²)	31 ± 6	30 ± 5
Waist (cm)	106 ± 14	104 ± 13
Current smokers	0	0
Duration of diabetes (years)	7.5 ± 5.4	7.6 ± 6.9
Glucose (mmol/L)	7.5 ± 1.6	7.7 ± 1.5
HbA_{1c} (%)	7.2 ± 0.6	7.4 ± 0.6
HbA_{1c} (mmol/mol)	55.7 ± 6.8	57.1 ± 6.9
Participants ≤7.1%	34 (48)	31 (44)
Participants >7.1%	37 (52)	39 (56)
Total cholesterol (mmol/L)	3.99 ± 1.00	4.15 ± 1.12
LDL-C (mmol/L)	2.13 ± 0.85	2.25 ± 0.90
HDL-C (mmol/L)	1.16 ± 0.28	1.20 ± 0.30
Triglycerides (mmol/L)	1.52 ± 0.80	1.54 ± 0.76
Systolic blood pressure (mmHg)	122 ± 11	121 ± 12
Diastolic blood pressure (mmHg)	72 ± 8	71 ± 8
Heart rate (bpm)	73 ± 10	73 ± 11
Absolute CVD risk score†	10.3 ± 5.1	9.6 ± 3.7
Relative CVD risk score	1.3 ± 0.7	1.3 ± 0.5
RHI ratio	1.73 ± 0.36	1.86 ± 0.50
Antihyperglycemic medications	71 (100)	70 (100)
Metformin	67 (94)	65 (93)
Sulfonylurea	18 (25)	22 (31)
Thiazolidinedione	4 (6)	8 (11)
Dipeptidyl peptidase-4 inhibitors	12 (17)	12 (17)
Meglitinides (nonsulfonylurea)	2 (3)	1 (1)
α-Glucosidase inhibitors	0 (0)	1 (1)
Injectable GLP-1 analog (Victoza)	0 (0)	1 (1)
Combination (Janumet)	2 (3)	2 (3)
Cholesterol-lowering medications	51 (72)	50 (71)
Blood pressure medications	43 (61)	39 (56)

•Data are mean ± SD or n (%). RHI, reactive hyperemia index.
•?*No significant differences in baseline (week 0) characteristics were seen between treatments.
•?†CVD risk score was calculated by using the Framingham CVD predictive equation by Anderson et al. (22).

Table 1 - Baseline (week 0) characteristics of study participants

By design, the test diet resulted in significantly greater increases in MUFA and ALA intake and corresponding lower carbohydrate intake, and hence GL, relative to the control diet (Supplementary Table 3). The relative GI and GL reductions for the test diet compared with the control diet were -19 GI units (95% CI -20 to -17, P < 0.0001) and -52 GL units (95% CI -59 to -45, P < 0.0001), respectively, and compliance with the test bread was 89% (95% CI 86%–93%) versus the control bread 77% (95% CI 74%–80%) (P < 0.0001).

Glycemic Control and Body Weight

Oral antihyperglycemic medication dosages increased in one and were reduced in five participants on the test diet. They decreased in four participants on the control diet, with no significant treatment differences.

The mean HbA1c change was -0.47% (-5.15 mmol/mol) absolute HbA1c units (95% CI -0.54% to -0.40% [-5.92 to -4.38 mmol/mol], P < 0.001) for the test diet and -0.31% (-3.44 mmol/mol) absolute HbA1c units (95% CI -0.38% to -0.25% [-4.17 to -2.71 mmol/mol], P < 0.001) for the control diet. The relative HbA1c reduction for the test diet was -0.16% (-1.71 mmol/mol) (95% CI -0.25% to -0.06% [-2.77 to -0.65 mmol/mol], P = 0.002) (Table 2) and remained statistically significant after adjustment for body weight change (P = 0.010). The body weight reductions were similar at -2.1 kg and -1.6 kg for both the test and the control diets, respectively (Table 2). There was no significant treatment difference in waist circumference, although, as with body weight, both treatments were associated with a reduction (waist circumference -1.8 vs. -2.4 cm for test and control diets, respectively) (Table 2).

Table 2
Changes from baseline in study measurements on the basis of raw data and significance of treatment differences for raw and multiple imputation

	Control diet		Test diet		Between diets		
	Week 0 (*n* = 71)[b]	Change[a] within diet	Week 0 (*n* = 70)[b]	Change[a] within diet	Change[a]	*P* value (raw)	*P* value (MI)
Weight (kg)	84.4 (79.9, 88.9)	−1.6 (−2.0, −1.3)*	84.5 (79.7, 89.4)	−2.1 (−2.5, −1.7)*	−0.5 (−1.0, 0.0)	0.070	0.458
Waist (cm)	106 (103, 110)	−2.4 (−2.9, −1.9)*	104 (101, 108)	−1.8 (−2.4, −1.3)*	0.6 (−0.2, 1.3)	0.143	0.065
HbA_{1c} (% HbA_{1c} unit)	7.2 (7.1, 7.4)	−0.31 (−0.38, −0.25)*	7.4 (7.2, 7.5)	−0.47 (−0.54, −0.40)*	−0.16 (−0.25, −0.06)	0.002	0.016
HbA_{1c} (mmol/mol)	55.7 (54.1, 57.3)	−3.44 (−4.17, −2.71)	57.1 (55.4, 58.8)	−5.15 (−5.92, −4.38)	−1.71 (−2.77, −0.65)		
Fasting glucose (mmol/L)	7.5 (7.1, 7.9)	−0.30 (−0.48, −0.12)*	7.7 (7.3, 8.0)	−0.37 (−0.56, −0.18)*	−0.07 (−0.33, 0.19)	0.591	0.491
Cholesterol (mmol/L)	4.0 (3.8, 4.2)	0.04 (−0.03, 0.12)	4.1 (3.9, 4.4)	−0.30 (−0.38, −0.22)*	−0.34 (−0.46, −0.23)	0.000	0.000
LDL-C (mmol/L)	2.1 (1.9, 2.3)	0.04 (−0.02, 0.11)	2.2 (2.0, 2.5)	−0.20 (−0.27, −0.13)*	−0.25 (−0.34, −0.15)	0.000	0.000
HDL-C (mmol/L)	1.2 (1.1, 1.2)	0.00 (−0.02, 0.02)	1.2 (1.1, 1.3)	−0.03 (−0.05, −0.01)*	−0.03 (−0.06, 0.00)	0.041	0.164
Triglycerides (mmol/L)	1.5 (1.3, 1.7)	−0.01 (−0.09, 0.07)	1.5 (1.4, 1.7)	−0.15 (−0.24, −0.07)*	−0.14 (−0.26, −0.03)	0.018	0.085
Total cholesterol/HDL-C	3.6 (3.3, 3.8)	0.02 (−0.05, 0.10)	3.6 (3.3, 3.8)	−0.19 (−0.27, −0.11)*	−0.21 (−0.32, −0.11)	0.000	0.000
LDL-C/HDL-C	1.9 (1.7, 2.1)	0.03 (−0.03, 0.09)	1.9 (1.7, 2.1)	−0.13 (−0.19, −0.07)*	−0.16 (−0.24, −0.07)	0.001	0.000
Systolic BP (mmHg)	122 (120, 125)	−5.1 (−6.7, −3.5)*	121 (118, 124)	−4.7 (−6.4, −2.9)*	0.4 (−1.9, 2.8)	0.718	0.892
Diastolic BP (mmHg)	72 (70, 74)	−3.3 (−4.2, −2.3)*	71 (69, 73)	−3.0 (−4.1, −2.0)*	0.2 (−1.2, 1.7)	0.740	0.763
Heart rate (bpm)	73 (71, 76)	−2.6 (−3.6, −1.6)*	73 (70, 75)	−2.3 (−3.4, −1.3)*	0.2 (−1.2, 1.7)	0.770	0.898
Absolute CVD risk[c] (10-year %)	10.3 (9.1, 11.5)	−0.53 (−0.84, −0.22)*	9.6 (8.8, 10.5)	−1.16 (−1.49, −0.82)*	−0.63 (−1.09, −0.17)	0.008	0.079
Relative CVD risk	1.3 (1.2, 1.5)	−0.07 (−0.12, −0.03)*	1.3 (1.2, 1.4)	−0.16 (−0.20, −0.11)*	−0.08 (−0.15, −0.02)	0.007	0.049
RHI ratio	1.7 (1.6, 1.8)	0.13 (0.00, 0.25)	1.9 (1.7, 2.0)	−0.12 (−0.24, 0.01)	−0.24 (−0.42, −0.06)	0.009	0.015

- Data are mean (lower confidence limit, upper confidence limit). Physical and biochemical measures were obtained at week 0, representing baseline, and weeks 8, 10, and 12 - baseline, representing change from baseline. BP, blood pressure; MI, multiple imputation; RHI, reactive hyperemia index.
- ?*Significant difference from baseline (P < 0.05).
- ?aMean, confidence limits, and P values determined using repeated-measures least squares means in PROC MIXED of SAS 9.2 with all available data.
- ?bControl: n = 71 at baseline and 64, 60, and 59 at weeks 8, 10, and 12, respectively. Test: n = 70 at baseline and 54 at weeks 8, 10, and 12.
- ?cCVD risk calculated using the Framingham CVD predictive equation by Anderson et al. (22).

Serum Lipids

Lipid-lowering medications were decreased in one participant on the test diet and three on the control diet, with no significant treatment difference in medication use (P = 0.620). The test produced significant falls within treatment in total cholesterol, LDL cholesterol (LDL-C), triglycerides, and the ratios of total cholesterol:HDL-C and LDL-C:HDL-C (Table 2). Relative to the control diet, the test diet resulted in significant reductions in total cholesterol (-0.34 mmol/L [95% CI -0.46 to -0.23], P < 0.0001), LDL-C (-0.25 mmol/L [95% CI -0.34 to -0.15], P < 0.0001), triglycerides (-0.14 mmol/L [95% CI -0.26 to -0.03], P = 0.018), and HDL-C (-0.03 mmol/L [95% CI -0.06 to 0.00], P < 0.041), albeit with still significant reductions in the ratios of total cholesterol:HDL-C (-0.21 [95% CI -0.32 to -0.11], P < 0.0001) and LDL-C:HDL-C (-0.16 [95% CI -0.24 to -0.07], P = 0.001) (Table 2).

Blood Pressure, Heart Rate, and Reactive Hyperemia Index

No significant treatment differences were seen in blood pressure or heart rate (Table 2). There was a nonsignificant reduction in vascular reactivity for the test diet but a nearly significant rise for the control diet, resulting in a relative increase in the reactive hyperemia index for the control diet (-0.24 [95% CI -0.42 to -0.06], P = 0.009) (Table 2).

CVD Risk

The Framingham risk score for CVD was reduced for both treatments but significantly more for the test diet (-0.6 [95% CI -1.1 to -0.2], P = 0.008) (Table 2).

Effect of Baseline Metabolic Syndrome Components and Framingham Risk Score Components on HbA1c Response

To determine whether participants at higher risk benefited more or less from the intervention, we assessed the HbA1c treatment effect for those with higher versus lower baseline measures for components of the metabolic syndrome and Framingham risk score. In general, the effect size and degree of significance was greatest in those whose baseline measures were elevated (Supplementary Table 2). However, by multiple imputation for missing data, only for those with higher systolic blood pressure (=130 mmHg) was the treatment difference significantly different from those with lower systolic blood pressure (<130 mmHg). In participants with systolic blood pressure >130 mmHg, the test diet HbA1creduction was substantial at -0.62% (-6.79 mmol/mol) (95% CI -0.77% to -0.47% [-8.40 to -5.19 mmol/mol], P < 0.001) (Fig. 2 and Supplementary Table 2). The treatment difference in HbA1c in those with systolic blood pressure >130 mmHg (-0.41% [-4.45 mmol/mol] [95% CI -0.62% to -0.19% (-6.80 to -2.09 mmol/mol)], P = 0.001) was more than five times the treatment difference (P = 0.003) seen in those with systolic blood pressure <130 mmHg (-0.07% [-0.81 mmol/mol] [95% CI -0.20% to 0.06% (-2.22 to 0.60 mmol/mol)], P = 0.253) (Supplementary Table 2).

To identify possible confounders, bivariate regression of HbA1c change on baseline components of the metabolic syndrome and Framingham risk score indicated that only age was a significant independent predictor of HbA1c change (P = 0.024), but the effect of the diet on HbA1c remained significant after controlling for age. No baseline measures contributed >10% to the HbA1c effect.

Adverse Events

There were no serious adverse events that required hospitalization. Five participants (three on the test diet and two on the control diet) were examined either by their family physician or at a local hospital emergency department for events unrelated to the diet. Five subjects had repeated HbA1c values >8.5% (69 mmol/mol) (three on the control diet and two on the test diet). Five participants (three on the control diet and two on the test diet) reported experiencing hypoglycemic episodes.

Conclusions

Increased MUFA and ALA (canola oil) consumption as part of a canola low-GL diet modestly lowered HbA1c but to a clinically significant extent in participants with raised blood pressure. Together with the reduction in Framingham risk score, these data support the use of canola oil in type 2 diabetes.

This study is the first to our knowledge to combine three dietary strategies (n-3 [ALA], MUFA, and low-GL diets) to manage diabetes that in the longer term have been associated with reduced CVD risk both in people with and without diabetes (3,4,9,10,27).

Previous meta-analyses of low-GI studies in type 2 diabetes have demonstrated a 0.43% reduction in HbA1c (28), and large studies have reported 0.4%–0.5% (4.4–5.5 mmol/mol) HbA1c reductions in their low-GI or -GL arm (25) similar to that seen in the current study. Recently, a major Spanish trial demonstrated a 30% CVD risk reduction after monounsaturated fat or nut (including n-3 [ALA]–rich walnuts) supplementation in high-risk trial participants, including those with type 2 diabetes (27). Furthermore, three meta-analyses of cohort studies indicated cardioprotective properties of low-GL diets in women without diabetes (4,29,30). In other studies, participants with increased BMI and insulin resistance but without diabetes demonstrated greater effects of low-GL diets on cardiovascular outcomes and weight loss, respectively (3,31). The current study also supports the concept of a greater effectiveness of low-GL diets in insulin-resistant states, including central adiposity, low HDL-C, and hypertension (24).

Despite the relatively low statin-treated LDL-C baseline concentrations of 2.17–2.22 mmol/L, canola oil consumption was associated with a significant additional reduction in LDL-C. According to statin dose-response studies, the observed LDL-C reduction could translate into an extra 7% reduction in CVD events or an additional 20 mg atorvastatin (32). Earlier studies demonstrated reduced triglyceride and VLDL cholesterol levels with increased MUFA intake in type 2 diabetes (33). To our knowledge, the current study is one of the first to assess the effect on serum lipids and glycemic control of an ALA-rich oil in type 2 diabetes. The effects of walnuts, as sources of ALA, have been studied in type 2 diabetes, and despite no effect on HbA1c, they were shown to reduce LDL-C (34) and improve vascular reactivity (35). In nondiabetic study participants, walnut consumption has also been associated with a reduction in LDL-C (36).

Increased whole-grain intake has consistently been associated with reduced CVD events in cohort studies (12,13) without a clear mechanism for this benefit. Whole-wheat fiber is nonviscous, and unlike viscous fibers from oats, barley, and other sources, it does not lower serum cholesterol (15,37) or reduce postprandial glycemia (38). However, there is evidence that whole-wheat products may reduce insulin resistance (39). Thus, this finding together with the possible improvement in vascular reactivity seen here after wheat bran intake may be part of the explanation for the reduced CVD risk among whole-grain consumers (11–14,40).

A study limitation is the relatively small effect size of HbA1c, the primary outcome, of 0.5% (5.1 mmol/mol) compared with the larger than previously seen reduction for the control diet of 0.3% (3.4 mmol/mol). However, in participants at increased risk for adverse outcomes, a clinically significant effect was observed, especially in those with hypertension, where the HbA1c reduction for the test diet was 0.62% (6.79 mmol/mol) and the relative HbA1c reduction was 0.41% (4.45 mmol/mol) and, therefore, in the range of 0.3%–0.4% and above that set by Food and Drug Administration guidelines for diabetes drug development (1). Furthermore, the study participants were already taking one or more oral antihyperglycemic agents, and 40% of the participants had HbA1clevels at the clinical target of =7.0% (53 mmol/mol).

The strengths of this study include the participant numbers and frequency of blood sampling that allowed small treatment differences to be detected. Furthermore, because the baseline HbA1c and blood lipid levels were close to target, it is likely that there may be greater reductions in participants with higher levels commonly seen in clinical practice.

The significance of differences have been provided for both the raw data, using repeated measures in the mixed model, and also where missing values have been derived by multiple imputation. Both approaches were similar in identifying significant differences. The raw data, however, also show significant treatment differences, favoring higher HDL-C, lower triglycerides, and lower absolute coronary heart disease risk for the test diet and indicate that older and more centrally obese (increased waist circumference) individuals responded better to the high-canola–low-GL diet. These data support the view that patients at greatest risk benefit most (3,24,31). The assessment using multiply imputed data failed to reach significance for these differences.

In conclusion, the reduction of GL by increasing the intake of MUFA and ALA (e.g., canola oil) to displace dietary carbohydrates and reduce the GL improved glycemic control, particularly in participants at high risk for diabetes complications, and reduced LDL-C, a feature not seen with similar low-GI diets (25). By contrast, whole-grain cereals appear to improve vascular reactivity, possibly helping to explain their benefit in CVD risk reduction.

Footnotes

- Clinical trial reg. no. NCT01348568, clinicaltrials.gov.
- This article contains Supplementary Data online at http://care.diabetesjournals.org/lookup/suppl/doi:10.2337/dc13-2990/-/DC1.
- A slide set summarizing this article is available online.

- Received December 20, 2013.
- Accepted April 15, 2014.

Source: American Diabetes Association.

Trade News

15-Year Low for World Olive Oil Production:

The International Olive Council (IOC) has predicted that world olive oil production will fall to the lowest level in 15 years.

While 3.27 million tons of olive oil were produced in 2013-2014, the output for 2014-2015 is estimated to reach only 2.39 million tons — 433,000 tons less than the world will consume, according to the IOC.

The poor olive harvests in Spain and Italy, the biggest producers of olive oil, are to blame for the 27 percent drop to the lowest levels since the 1990-91 season.

Spain is expected to experience a 54-percent reduction in olive oil production: only 825,700 tons of oil compared to last year's record output of 1,780,000 tons.

Production in Italy is expected to decrease from 461,200 tons to 302,500 tons — a 34 percent drop.

Spain's olive crop was adversely affected by hot weather during the flowering season and disease, while Italy's olives suffered from olive fly infestation and an excessively wet summer.

Meanwhile, some countries have experienced a surplus. Greece, the third-biggest olive-oil producer in the world this year will be within reach of the number two spot with its expected yield of 300,000 tons, up from 131,900 last year (+127%), while Tunisia's output increased significantly to 260,000 tons from 70,000 (+271%) according to estimates.

Due to decreased outputs, olive oil prices are expected to rise significantly while the IOC predicts that the global consumption of olive oil is set to fall from 3.03 to 2.82 million tons.

Source: Olive Oil Council

Soybean Outlook Raised by Oil World on Oilseed Crop:

World production of 10 major oilseeds is forecast to climb 4.3 percent in 2014-15 to a record, with the outlook for soybeans raised on increased estimates for the U.S. and Brazil, Oil World said.

Oilseed output may rise to 519.7 million metric tons from 498.2 million tons in 2013-14, the Hamburg-based researcher wrote in an e-mailed report. The outlook was raised by 3.7 million tons from a previous forecast, Oil World said.

Soybean futures have slumped 29 percent in Chicago in the past 12 months, the worst performance on the Bloomberg Commodity Index, amid expectations for record production in the U.S., the biggest grower.

"A phenomenal soybean crop is being collected this year in the U.S.," Oil World wrote. "Improving weather conditions mean that one of the last hurdles separating the bumper U.S. crop from the market is being removed. Large supplies are still setting the tone in price-making."

Farmers across the globe may harvest 310.8 million tons of soybeans in 2014-15 from 285.2 million tons a year earlier, according to Oil World. The outlook was raised from 306.7 million tons last month.

U.S. soybean production is seen rising to 106.5 million tons from 92.1 million tons, while domestic ending stocks of the oilseed are predicted to climb to 12 million tons by the end of August 2015 from 3.4 million tons a year earlier.

"Three consecutive years of large increases in soybean output are turning the market from shortage to surplus," Oil World wrote. "In this scenario prices are likely to fall at least temporarily below production cost, implying that there is still some downward potential from current levels, depending on the producing region."

World rapeseed and canola harvests may rise to 68.8 million tons from 67.3 million tons, while sunflower seed production may decline to 41.4 million tons in 2014-15 from 42.5 million tons, according to Oil World.

Crushing of the 10 major oilseeds is predicted to increase 3.6 percent to 424.9 million tons, with processing of soybeans climbing to 253.3 million tons from 237.8 million tons, Oil World said.

Production of 12 oilseed meals is predicted to climb to 318 million tons from 305.7 million tons, led by a jump in soybean meal output to 199.5 million tons from 187.3 million tons, the report showed.

Oilseed ending stocks are forecast to rise to 102 million tons at the end of 2014-15 from 84.9 million tons a year earlier, boosting the stocks-to-use ratio to 20.3 percent from 17.5 percent, according to Oil World's outlook.

Courtesy: Bloomberg news

Indonesia lawmakers draft bill to slash foreign ownership of plantations:

Indonesian lawmakers are looking to restrict foreign ownership of plantations to no more than 30 percent, as the top palm oil producer tries to maximise land usage, protect indigenous people and tighten environmental controls in the sector.

A new draft bill drawn up by members of Indonesia's parliament aims to open up the sector to smaller, local players. But it would also discourage foreign investment just after the nation has set an ambitious goal of raising its palm oil output by a third to 40 million tonnes by 2020.

Foreign ownership of Indonesian plantations is currently set at a maximum of 95 percent. As well as simplifying Indonesia's complex rules on land use, the new proposed law may also make it easier to prosecute businesses responsible for Southeast Asia's annual "haze" season.

"It's a bombshell and has snuck in under the radar, and as far as I know, without consultation with the industry," said a Jakarta-based financial advisor with an major international accountancy firm, who is not authorised to speak to the media.

"There will clearly be a decline in new foreign investment ... I would think there will be a decline in the capital value of plantations."

Foreign plantation firms currently operating in Southeast Asia's largest economy include Singapore-listed Golden Agri-Resources and Wilmar International, Malaysia's Sime Darby Bhd and Cargill.

Limiting foreign ownership in palm firms to 30 percent would hinder the flow of overseas capital needed to develop and modernise the industry, said Fadhil Hasan, executive director at the Indonesian Palm Oil Association.

Golden Agri-Resources and Wilmar were unable to give an immediate comment on Friday, while Sime Darby and Cargill could not be reached for comment.

The Indonesian government has introduced a series of nationalistic rules for commodity exports, including palm, cocoa and mining, in an effort to boost domestic processing industries and boost the value of its exports.

Indonesia's parliament is looking to finish discussions on the draft bill with the government soon and expects it to be approved before the new administration is in place, Gamal Nasir, director general of plantations at the agriculture ministry told Reuters.

Following elections last month, outgoing President Susilo Bambang Yudhoyono will be replaced by Jakarta governor and president-elect Joko Widodo in October.

During his campaign, Jokowi - as he is known - outlined a number of nationalistic agricultural policies, including boosting smallholder access to land ownership.

If the draft bill becomes law, it would be retroactive for companies that already own plantations, said Herman Khaeron, an influential lawmaker and vice chairman of the parliamentary committee for agriculture, forestry, fisheries and maritime.

This interpretation was rejected by agriculture ministry and industry officials.

Firms would be given five years to comply with the new bill, according to a copy of the draft seen by Reuters, and those that refused to comply may face fines, temporary suspensions or the revoking of licenses.

Last year, Indonesia, also a major pulp and paper supplier, introduced a regulation to restrict to 100,000 hectares the plantation area of new private palm firms.

Courtesy: Reuters

California Commission Releases Proposed Olive Oil Standards

The newly created Olive Oil Commission of California has made its recommendations for olive oil grade and labeling standards to the California Secretary of Food and Agriculture. The standards differ in some aspects from the U.S. Department of Agriculture (USDA) and other organization’s guidelines.

The Commission was created as a means for California olive oil producers and growers to self-govern their industry. The Commission’s first board of directors was elected by their peers earlier this year with a mission of improving consumer confidence in olive oil quality and fostering growth in the industry.

The board held its first meeting in May 2014 and recently issued its report recommending grading and labeling standards applicable to California olive oil producers who generate 5,000 or more gallons per year. If the Commission recommendations become law, they will only apply to California oil but may eventually affect all U.S. and importer standards.

A few highlights for labeling standards include:

- Terms such as, “Pure,” “Light,” Extra Light,” and “Super Virgin” on olive oil labels should be prohibited because they mislead purchasers as to the oil characteristics.

- One hundred percent of the bottles of California oil should be from olives grown in California.

- If varietal names appear on the label, they should be listed in weight order.

- If the harvest date appears on the label, all oils in the bottle should have been harvested during the same harvest period.

- All labels should include information that allows for traceability of the oil throughout its growing and processing stages.

- Refined olive oil blend should not be labeled as olive oil.

Quality assurance measures are also detailed in the report. Some of the measures differ from other standards in use.

- There should be mandatory testing of olive oil using accredited labs. Grading will be based on test results. The recommended testing process is not yet fully developed.

- Free fatty acid content measures the quality of oil as affected by its fruit quality and care in handling. For Extra Virgin olive oil (EVOO), the free fatty acid content should be less than or equal to 0.5 percent. The USDA standard and International Olive Council (IOC) standard is less than or equal to 0.8 percent.

- Peroxide values indicate levels of oxidation. For EVOO, the values should be less than or equal to 15.0 (meq 02/kg oil). This is the same standard used by the Extra Virgin Alliance whereas the USDA and IOC standard is less than or equal to 20.0.

- "PPP," which measures oil degradation, and "DAGs" levels, which indicate oxidation or adulteration should be tested for EVOO. These measures are not included in the USDA or North American Olive Oil Association guidelines but are part of the Extra Virgin Alliance standards.

- Sensory analysis of EVOO must show zero defects and median fruitiness greater than zero. This matches the USDA and IOC but the Extra Virgin Alliance and the California Olive Oil Council require fruitiness greater than 1.0.

Kimberly Houlding, executive director of the American Olive Oil Producers Association, lauded the recommendations. "The standards put forth are sound, scientifically-based standards—standards that much of the industry is already meeting." She believes that if the recommendations are adopted, they will give consumers additional confidence about the quality of what is inside the bottle. Houlding also said that removing labels such as "Pure" and "Light" will improve purchaser understanding and clarity.

The Commission recommendations will be considered at a public hearing on July 15, 2014 in Sacramento, California.

Source: Olive Oil Commission of California

New Britain Palm Oil's Biggest Shareholder Set To Sell On Stake:

Alliance News -- LONDON, ENGLAND -- July 31, 2014 -- New Britain Palm Oil Ltd Thursday said its largest shareholder, Kulim (Malaysia) Berhad, had told it that it will sell its entire 48.97% stake in the company, and Kulim had picked another Malaysian company, Sime Darby Berhad, as its preferred bidder for the stake.

New Britain Palm Oil said it was unaware of the terms of the proposed deal, but reassured other shareholders that a deal could only be done if approved by those holders in a vote and that if any takeover offer is made, then that offer is open to the other shareholders.

"To date, the company has not received any direct proposal from Sime Darby or any other party with respect to the proposed acquisition of Kulim's equity stake. The company has not been informed as to the proposed terms of the transaction between Kulim and Sime Darby (including the indicative price offered by Sime Darby), nor is it known whether such transaction will result in a change of control of the company or a formal takeover offer for all or part of the company's issued share capital," it said in a statement.

New Britain Palm Oil had put out a statement last month saying it was unable to comment on press reports that Kulim Berhad was in talks to sell its stake.

Last year, Kulim Berhad's attempt to take a bigger stake in the company failed after the takeover regulator in Papua New Guinea ruled it was against the country's national interests. The country's government had just brought in new rules preventing takeovers deemed not to be in the country's national interest.

Kulim Berhad had wanted to increase its stake to 69%, and its offer had been widely accepted by shareholders until the deal was blocked by the National Court of Papua New Guinea.

Under Papua New Guinea takeover regulations, New Britain Palm Oil must now provide its shareholders with a report prepared by an independent adviser as to the merits of the proposed acquisition or offer, and a statement from the company's directors with their recommendation to shareholders in relation to the proposed acquisition or offer.

New Britain Palm Oil said it has appointed law firm Ashurst PNG as its legal counsel and accounting firm BDO as the independent adviser.

It said it also intends to establish an independent board committee "to ensure that the best possible outcome is obtained for all shareholders" and to ensure compliance with the takeover rules.

Malaysian investment company Kulim Berhad currently has two directors on New Britain Palm Oil's board.

Sime Darby is a Malaysia-based, listed conglomerate involved in plantations, property, industrial, motors and energy and utilities. On its website, it says it is one of the world's largest listed palm oil companies, producing about 2.47 million tonnes, or 5% of the world's crude palm oil output annually.

New Britain Palm Oil has palm oil and sugar plantations in Australasia, and has two refineries, one in Papua New Guinea and the other in the UK. It is headquartered in Papua New Guinea and listed on the Port Moresby Stock Exchange as well as the London Stock Exchange, hence it falls under Papua New Guinea takeover rules. Its shares were down 1.7% at 511.00 pence Thursday.

Source: Alliance News Limited

Important Figures

Rapeseed oil details, World (in ,000 MT)

	14/15 Nov '14	14/15 Oct '14	13/14	12/13	11/12
Production	26,756	26,469	26,089	24,987	24,109
Beginning Stocks	3,624	3,919	2,922	1,622	1,132
Imports	4,053	4,053	3,687	3,873	4,011
Total Supply	34,433	34,441	32,698	30,482	29,252
Exports	4,173	4,173	3,749	3,936	3,970
Domestic Consumption	26,626	26,351	25,325	23,624	23,660
Industrial Dom. Cons.	7,863	7,567	7,761	7,328	7,830
Food Use Dom. Cons.	18,742	18,760	17,548	16,282	15,817
Feed Waste Dom. Cons.	21	24	16	14	13
Crush	67,068	66,266	65,498	62,491	60,479
Total Distribution	34,433	34,441	32,698	30,482	29,252
Ending Stocks	3,634	3,917	3,624	2,922	1,622

Rapeseed oil details, Country wise (in ,000 MT)

S.N.	Country	14/15 Nov '14	14/15 Oct '14	13/14	12/13	11/12
1	European Union	9,950	9,841	9,570	9,424	8,980
2	China, Peoples Republic of	6,347	6,169	6,579	6,045	5,725
3	Canada	3,160	3,160	3,050	2,950	3,070
4	India	2,600	2,600	2,500	2,350	2,200
5	Japan	1,012	1,012	1,010	1,055	1,000
6	United States	781	781	723	580	499
7	Mexico	600	600	580	580	608
8	Russian Federation	488	488	478	416	374
9	Pakistan	455	455	360	395	480
10	Australia	320	320	300	280	280
11	United Arab Emirates	293	293	293	264	345
12	Belarus	240	240	238	238	137
13	Bangladesh	166	166	125	166	162
14	Turkey	77	77	76	48	52
15	Chile	62	62	57	61	42
16	Ukraine	57	57	59	3	62
17	Kazakhstan, Republic of	45	45	25	31	23
18	Paraguay	42	42	23	37	26
19	Switzerland	29	29	29	29	31
20	Korea, Republic of	18	18	-	22	-

Rapeseed oil Details, European Union (in ,000 MT)

	14/15 Nov '14	14/15 Oct '14	13/14	12/13	11/12
Production	9,950	9,841	9,570	9,424	8,980
Beginning Stocks	227	232	147	109	84
Imports	250	250	296	210	607
Total Supply	10,427	10,323	10,013	9,743	9,671
Exports	400	400	312	445	230
Domestic Consumption	9,720	9,623	9,474	9,151	9,332
Industrial Dom. Cons.	7,000	7,000	6,900	6,700	7,000
Food Use Dom. Cons.	2,700	2,600	2,559	2,438	2,320
Feed Waste Dom. Cons.	20	23	15	13	12
Crush	24,000	23,700	23,030	22,680	21,610
Total Distribution	10,427	10,323	10,013	9,743	9,671
Ending Stocks	307	300	227	147	109

Rapeseed oil Details, China - Peoples Republic of (in ,000 MT)

	14/15 Nov '14	14/15 Oct '14	13/14	12/13	11/12
Production	6,347	6,169	6,579	6,045	5,725
Beginning Stocks	2,607	2,897	2,157	836	336
Imports	1,400	1,400	902	1,598	1,036
Total Supply	10,354	10,466	9,638	8,479	7,097
Exports	10	10	6	6	6
Domestic Consumption	7,655	7,477	7,025	6,316	6,255
Food Use Dom. Cons.	7,655	7,477	7,025	6,316	6,255
Crush	17,850	17,350	18,500	17,000	16,100
Total Distribution	10,354	10,466	9,638	8,479	7,097
Ending Stocks	2,689	2,979	2,607	2,157	836

Rapeseed oil Details, Canada (in ,000 MT)

	14/15 Nov '14	14/15 Oct '14	13/14	12/13	11/12
Production	3,160	3,160	3,050	2,950	3,070
Beginning Stocks	211	211	71	39	98
Imports	80	80	83	170	92
Total Supply	3,451	3,451	3,204	3,159	3,260
Exports	2,650	2,650	2,348	2,516	2,676
Domestic Consumption	660	660	645	572	545
Industrial Dom. Cons.	90	90	85	47	50
Food Use Dom. Cons.	570	570	560	525	495
Crush	7,200	7,200	6,961	6,717	6,999
Total Distribution	3,451	3,451	3,204	3,159	3,260
Ending Stocks	141	141	211	71	39

Rapeseed oil Details, India (in ,000 MT)

	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
Production	2,600	2,600	2,500	2,350	2,200
Beginning Stocks	167	167	114	158	185
Imports	150	50	160	8	98
Total Supply	2,917	2,817	2,774	2,516	2,483
Exports	2	2	2	2	2
Domestic Consumption	2,800	2,700	2,605	2,400	2,323
Industrial Dom. Cons.	80	80	70	60	50
Food Use Dom. Cons.	2,720	2,620	2,535	2,340	2,273
Crush	6,500	6,500	6,300	6,000	5,700
Total Distribution	2,917	2,817	2,774	2,516	2,483
Ending Stocks	115	115	167	114	158

Rapeseed oil Details, Japan (in ,000 MT)

	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
Production	1,012	1,012	1,010	1,055	1,000
Beginning Stocks	116	116	118	63	49
Imports	10	10	10	21	29
Total Supply	1,138	1,138	1,138	1,139	1,078
Exports	1	1	2	1	-
Domestic Consumption	1,025	1,025	1,020	1,020	1,015
Industrial Dom. Cons.	60	60	60	60	60
Food Use Dom. Cons.	965	965	960	960	955
Crush	2,450	2,450	2,370	2,438	2,367
Total Distribution	1,138	1,138	1,138	1,139	1,078
Ending Stocks	112	112	116	118	63

Cottonseed oil details, World (in ,000 MT)

	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
Production	5,176	5,179	5,143	5,209	5,213
Beginning Stocks	213	213	214	259	266
Imports	75	75	69	77	77
Total Supply	5,464	5,467	5,426	5,545	5,556
Exports	140	140	126	150	168
Domestic Consumption	5,126	5,129	5,087	5,181	5,129
Industrial Dom. Cons.	322	322	322	296	321
Food Use Dom. Cons.	4,804	4,807	4,765	4,885	4,808
Feed Waste Dom. Cons.	-	-	-	-	-
Crush	34,616	34,455	34,242	34,557	34,409
Total Distribution	5,464	5,467	5,426	5,545	5,556
Ending Stocks	198	198	213	214	259

Cottonseed oil details, Country wise (in ,000 MT)

S.N.	Country	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
1	China, Peoples Republic of	1,396	1,396	1,498	1,566	1,476
2	India	1,390	1,390	1,305	1,220	1,210
3	Pakistan	560	560	560	560	565
4	Brazil	380	380	396	347	455
5	United States	352	352	286	363	342
6	Uzbekistan, Republic of	230	230	233	240	236
7	Turkey	147	147	125	146	145
8	Australia	96	96	109	109	109
9	Turkmenistan	82	82	82	82	82
10	Mexico	74	74	66	74	76
11	European Union	51	51	51	49	51
12	Burkina	35	35	31	33	25
13	Mali	32	32	32	35	26
14	Burma	31	31	31	31	31
15	Cameroon	28	28	26	26	18
16	Egypt	25	25	21	24	34
17	Benin	23	23	23	19	14
18	Argentina	22	22	22	13	17
19	Tajikistan, Republic of	22	22	24	26	28
20	Korea, Republic of	20	20	21	21	19

Cotton seed oil details, China Peoples Republic of (in ,000 MT)

	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
Production	1,396	1,396	1,498	1,566	1,476
Total Supply	1,396	1,396	1,498	1,566	1,476
Exports	2	2	2	1	1
Domestic Consumption	1,394	1,394	1,496	1,565	1,475
Food Use Dom. Cons.	1,394	1,394	1,496	1,565	1,475
Crush	9,600	9,600	10,300	10,770	10,150
Total Distribution	1,396	1,396	1,498	1,566	1,476

Cottonseed oil details, India (in ,000 MT)

	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
Production	1,390	1,390	1,305	1,220	1,210
Beginning Stocks	58	58	48	66	83
Imports	-	-	-	-	-
Total Supply	1,448	1,448	1,353	1,286	1,293
Domestic Consumption	1,385	1,385	1,295	1,238	1,227
Industrial Dom. Cons.	45	45	45	43	42
Food Use Dom. Cons.	1,340	1,340	1,250	1,195	1,185
Crush	9,650	9,650	9,100	8,500	8,400
Total Distribution	1,448	1,448	1,353	1,286	1,293
Ending Stocks	63	63	58	48	66

Cottonseed oil details, Pakistan (in ,000 MT)

	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
Production	560	560	560	560	565
Beginning Stocks	10	10	15	20	20
Imports	-	-	-	-	-
Total Supply	570	570	575	580	585
Domestic Consumption	565	565	565	565	565
Industrial Dom. Cons.	30	30	30	30	30
Food Use Dom. Cons.	535	535	535	535	535
Feed Waste Dom. Cons.	-	-	-	-	-
Crush	3,850	3,850	3,650	3,650	3,600
Total Distribution	570	570	575	580	585
Ending Stocks	5	5	10	15	20

Cotton seed oil Details, Brazil (in ,000 MT)

	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
Production	380	380	396	347	455
Beginning Stocks	44	44	44	70	58
Imports	-	-	-	-	-
Total Supply	424	424	440	417	513
Exports	-	-	-	-	1
Domestic Consumption	390	390	396	373	442
Industrial Dom. Cons.	200	200	200	173	200
Food Use Dom. Cons.	190	190	196	200	242
Crush	2,300	2,300	2,400	2,100	2,750
Total Distribution	424	424	440	417	513
Ending Stocks	34	34	44	44	70

Cottonseed oil details, USA (in ,000 MT)

	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
Production	352	352	286	363	342
Beginning Stocks	45	45	45	45	75
Imports	9	9	14	9	5
Total Supply	406	406	345	417	422
Exports	93	93	67	100	117
Domestic Consumption	268	268	233	272	260
Food Use Dom. Cons.	268	268	233	272	260
Feed Waste Dom. Cons.	-	-	-	-	-
Crush	2,200	2,200	1,814	2,268	2,177
Total Distribution	406	406	345	417	422
Ending Stocks	45	45	45	45	45

Palm oil details, world (in ,000 MT)

	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
Production	62,793	63,293	59,059	55,969	52,111
Beginning Stocks	7,190	7,718	7,190	7,288	6,085
Imports	43,231	42,521	40,490	41,847	38,990
Total Supply	113,214	113,532	106,739	105,104	97,186
Exports	44,867	44,567	43,033	43,420	40,074
Domestic Consumption	60,548	60,543	56,516	54,494	49,824
Industrial Dom. Cons.	17,420	17,720	15,801	14,037	12,426
Food Use Dom. Cons.	42,318	42,013	39,940	39,742	36,687
Feed Waste Dom. Cons.	810	810	775	715	711
Total Distribution	113,214	113,532	106,739	105,104	97,186
Ending Stocks	7,799	8,422	7,190	7,190	7,288

Palm Oil details, country wise (in ,000 MT)

S.N.	Country	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
1	Indonesia	33,000	33,500	30,500	28,500	26,200
2	Malaysia	21,250	21,250	20,161	19,321	18,202
3	Thailand	2,250	2,250	2,150	2,135	1,892
4	Colombia	1,070	1,070	1,042	974	945
5	Nigeria	930	930	930	910	850
6	Papua New Guinea	630	630	630	610	582
7	Ecuador	575	575	565	540	473
8	Honduras	440	440	430	410	395
9	Cote d'Ivoire	400	400	400	390	400
10	Guatemala	355	355	350	323	291
11	Brazil	340	340	340	340	310
12	Cameroon	270	270	288	265	354
13	Costa Rica	270	270	270	265	260
14	Congo, Democratic Rep of the	215	215	215	205	187
15	Ghana	135	135	135	130	120
16	Philippines	135	135	122	124	130
17	Mexico	83	83	83	83	91
18	Angola	58	58	58	58	57
19	Venezuela	55	55	55	55	60
20	Dominican Republic	53	53	53	53	44

Palm oil details, Indonesia (in ,000 MT)

	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
Production	33,000	33,500	30,500	28,500	26,200
Beginning Stocks	1,918	2,618	1,758	1,445	825
Imports	-	-	40	38	1
Total Supply	34,918	36,118	32,298	29,983	27,026
Exports	22,300	22,000	21,200	20,373	18,452
Domestic Consumption	10,520	11,220	9,180	7,852	7,129
Industrial Dom. Cons.	4,700	5,000	3,700	2,735	2,211
Food Use Dom. Cons.	5,500	5,900	5,200	4,882	4,702
Feed Waste Dom. Cons.	320	320	280	235	216
Total Distribution	34,918	36,118	32,298	29,983	27,026
Ending Stocks	2,098	2,898	1,918	1,758	1,445

Palm oil details, Malaysia (in ,000 MT)

	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
Production	21,250	21,250	20,161	19,321	18,202
Beginning Stocks	2,090	2,090	1,784	2,481	2,163
Imports	275	275	319	957	1,852
Total Supply	23,615	23,615	22,264	22,759	22,217
Exports	18,000	18,000	17,344	18,524	17,586
Domestic Consumption	3,090	3,090	2,830	2,451	2,150
Industrial Dom. Cons.	2,400	2,400	2,150	1,781	1,500
Food Use Dom. Cons.	650	650	640	630	620
Feed Waste Dom. Cons.	40	40	40	40	30
Total Distribution	23,615	23,615	22,264	22,759	22,217
Ending Stocks	2,525	2,525	2,090	1,784	2,481

Palm oil details, Thai land (in ,000 MT)

	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
Production	2,250	2,250	2,150	2,135	1,892
Beginning Stocks	242	242	267	287	162
Imports	25	25	25	-	44
Total Supply	2,517	2,517	2,442	2,422	2,098
Exports	500	500	400	550	293
Domestic Consumption	1,820	1,820	1,800	1,605	1,518
Industrial Dom. Cons.	1,200	1,200	1,200	1,050	1,000
Food Use Dom. Cons.	510	510	500	460	420
Feed Waste Dom. Cons.	110	110	100	95	98
Total Distribution	2,517	2,517	2,442	2,422	2,098
Ending Stocks	197	197	242	267	287

Palm oil details, Colombia (in ,000 MT)

	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
Production	1,070	1,070	1,042	974	945
Beginning Stocks	49	49	47	55	3
Imports	130	130	125	121	133
Total Supply	1,249	1,249	1,214	1,150	1,081
Exports	240	240	220	218	136
Domestic Consumption	960	960	945	885	890
Industrial Dom. Cons.	495	495	480	440	418
Food Use Dom. Cons.	460	460	450	440	435
Feed Waste Dom. Cons.	5	5	15	5	37
Total Distribution	1,249	1,249	1,214	1,150	1,081
Ending Stocks	49	49	49	47	55

Palm oil details, Nigeria (in ,000 MT)

	14/15 Dec '14	14/15 Nov '14	13/14	12/13	11/12
Production	930	930	930	910	850
Beginning Stocks	79	79	72	85	98
Imports	525	525	500	470	440
Total Supply	1,534	1,534	1,502	1,465	1,388
Exports	18	18	18	18	18
Domestic Consumption	1,430	1,430	1,405	1,375	1,285
Industrial Dom. Cons.	270	270	265	245	235
Food Use Dom. Cons.	1,160	1,160	1,140	1,130	1,050
Feed Waste Dom. Cons.	-	-	-	-	-
Total Distribution	1,534	1,534	1,502	1,465	1,388
Ending Stocks	86	86	79	72	85

Health Tips

A Call for a Low-Carb Diet That Embraces Fat:

People who avoid carbohydrates and eat more fat, even saturated fat, lose more body fat and have fewer cardiovascular risks than people who follow the low-fat diet that health authorities have favored for decades, a major new study shows.

The findings are unlikely to be the final salvo in what has been a long and often contentious debate about what foods are best to eat for weight loss and overall health. The notion that dietary fat is harmful, particularly saturated fat, arose decades ago from comparisons of disease rates among large national populations.

But more recent clinical studies in which individuals and their diets were assessed over time have produced a more complex picture. Some have provided strong evidence that people can sharply reduce their heart disease risk by eating fewer carbohydrates and more dietary fat, with the exception of trans fats. The new findings suggest that this strategy more effectively reduces body fat and also lowers overall weight.

The new study was financed by the National Institutes of Health and published in the Annals of Internal Medicine. It included a racially diverse group of 150 men and women — a rarity in clinical nutrition studies — who were assigned to follow diets for one year that limited either the amount of carbs or fat that they could eat, but not overall calories.

“To my knowledge, this is one of the first long-term trials that given these diets without calorie restrictions,” said Dariush Mozaffarian, the dean of the Friedman School of Nutrition Science and Policy at Tufts University, who was not involved in the new study. “It shows that in a free-living setting, cutting your carbs helps you lose weight without focusing on calories. And that’s really important because someone can change what they eat more easily than trying to cut down on their calories.”

Diets low in carbohydrates and higher in fat and protein have been commonly used for weight loss since Dr. Robert Atkins popularized the approach in the 1970s. Among the longstanding criticisms is that these diets cause people to lose weight in the form of water instead of body fat, and that cholesterol and other heart disease risk factors climb because dieters invariably raise their intake of saturated fat by eating more meat and dairy.

Many nutritionists and health authorities have “actively advised against” low-carbohydrate diets, said the lead author of the new study, Dr. Lydia A. Bazzano of the Tulane University School of Public Health and Tropical Medicine. “It’s been thought that your saturated fat is, of course, going to increase, and then your cholesterol is going to go up,” she said. “And then bad things will happen in general.”

The new study showed that was not the case.

By the end of the yearlong trial, people in the low-carbohydrate group had lost about eight pounds more on average than those in the low-fat group. They had significantly greater reductions in body fat than the low-fat group, and improvements in lean muscle mass — even though neither group changed their levels of physical activity.

While the low-fat group did lose weight, they appeared to lose more muscle than fat.

“They actually lost lean muscle mass, which is a bad thing,” Dr. Mozaffarian said. “Your balance of lean mass versus fat mass is much more important than weight. And that’s a very important finding that shows why the low-carb, high-fat group did so metabolically well.”

The high-fat group followed something of a modified Atkins diet. They were told to eat mostly protein and fat, and to choose foods with primarily unsaturated fats, like fish, olive oil and nuts. But they were allowed to eat foods higher in saturated fat as well, including cheese and red meat.

A typical day’s diet was not onerous: It might consist of eggs for breakfast, tuna salad for lunch, and some kind of protein for dinner — like red meat, chicken, fish, pork or tofu — along with vegetables. Low-carb participants were encouraged to cook with olive and canola oils, but butter was allowed, too.

Over all, they took in a little more than 13 percent of their daily calories from saturated fat, more than double the 5 to 6 percent limit recommended by the American Heart Association. The majority of their fat intake, however, was unsaturated fats.

The low-fat group included more grains, cereals and starches in their diet. They reduced their total fat intake to less than 30 percent of their daily calories, which is in line with the federal government’s dietary guidelines. The other group increased their total fat intake to more than 40 percent of daily calories.

Both groups were encouraged to eat vegetables, and the low-carbohydrate group was told that eating some beans and fresh fruit was fine as well.

In the end, people in the low-carbohydrate group saw markers of inflammation and triglycerides — a type of fat that circulates in the blood — plunge. Their HDL, the so-called good cholesterol, rose more sharply than it did for people in the low-fat group.

Blood pressure, total cholesterol and LDL, the so-called bad cholesterol, stayed about the same for people in each group.

Nonetheless, those on the low-carbohydrate diet ultimately did so well that they managed to lower their Framingham risk scores, which calculate the likelihood of a heart attack within the next 10 years. The low-fat group on average had no improvement in their scores.

The decrease in risk on the low-carbohydrate diet “should translate into a substantial benefit,” said Dr. Allan Sniderman, a professor of cardiology at McGill University in Montreal.

One important predictor of heart disease that the study did not assess, Dr. Sniderman said, was the relative size and number of LDL particles in the bloodstream. Two people can have the same overall LDL concentration, but very different levels of risk depending on whether they have a lot of small, dense LDL particles or a small number of large and fluffy particles.

Eating refined carbohydrates tends to raise the overall number of LDL particles and shift them toward the small, dense variety, which contributes to atherosclerosis. Saturated fat tends to make LDL particles larger, more buoyant and less likely to clog arteries, at least when carbohydrate intake is not high, said Dr. Ronald M. Krauss, the former chairman of the American Heart Association’s dietary guidelines committee.

Small, dense LDL is the kind typically found in heart patients and in people who have high triglycerides, central obesity and other aspects of the so-called metabolic syndrome, said Dr. Krauss, who is also the director of atherosclerosis research at Children’s Hospital Oakland Research Institute.

“I’ve been a strong advocate of moving saturated fat down the list of priorities in dietary recommendations for one reason: because of the increasing importance of metabolic syndrome and the role that carbohydrates play,” Dr. Krauss said.

Dr. Mozaffarian said the research suggested that health authorities should pivot away from fat restrictions and encourage people to eat fewer processed foods, particularly those with refined carbohydrates.

The average person may not pay much attention to the federal dietary guidelines, but their influence can be seen, for example, in school lunch programs, which is why many schools forbid whole milk but serve their students fat-free chocolate milk loaded with sugar, Dr. Mozaffarian said.

Courtesy: Annals of Internal Medicine

Fish-eaters may keep more gray matter in old age:

Eating baked or broiled fish at least once a week may preserve parts of the brain that are hit hard by aging, according to a small new study.

Brain scans showed that people over age 65 who regularly ate fish had 14 percent more gray matter in brain regions associated with memory and 4 percent more in areas devoted to cognition than people who didn’t consume fish regularly.

The effect was independent of omega-3 fatty acids in the study participants’ blood, suggesting that a fondness for fish is a sign of an overall healthy lifestyle that benefits the brain, researchers said.

“The presence of baked or broiled fish in the diet reflected more general differences in lifestyle than could be accounted for simply by measuring one biological compound." said Dr. James Becker, the study's lead author from the University of Pittsburgh in Pennsylvania.

"Even after controlling for a range of other factors that might have accounted for differences in brain health, eating baked or broiled fish was still a significant predictor of a healthy brain,” he said.

Omega-3 fatty acids, which are plentiful in oily fish varieties like tuna and salmon, have been credited with benefits for the heart and brain, including possibly preventing the normal brain shrinkage that happens with age (see Reuters Health article of January 24, 2014 here: reut.rs/1pO5Xgb).

Becker and his coauthors write in the American Journal of Preventive Medicine that there are more than 20 million people with dementia in the world and that number is expected to double every 20 years until there are 80 million people afflicted in the year 2040.

Any modifiable behavior that could help preserve brain function in the aging population is worth exploring “as a means to influence risk of dementia,” the study team writes.

To examine the role fish might play, and whether it is based on omega-3's benefits, the researchers analyzed data from a larger long-term U.S. study that followed adults over age 65 for more than 10 years between 1989 and 1999.

They focused on 260 people who started out without cognitive problems or dementia, had blood tests during the study period and had magnetic resonance imaging (MRI) of their brains at the end. The participants’ median age was 78 at the end of the study.

Of this group, 163 people ate baked or broiled fish at least once a week and were classified as regular fish consumers. The other 97 didn’t eat as much fish.

Becker and his colleagues found the regular fish consumers had more gray matter, brain tissue that is made up mostly of brain cells, in two parts of the brain that are thought to maintain healthy brain function as adults get older.

One brain region where differences were apparent is in the right frontal lobe, an area involved in cognitive ability. The other region, which includes the hippocampus, is critical to memory functioning.

In the first region, there was a 4.3 percent difference in gray matter volume between fish eaters and those who avoided fish. In the memory-linked region, the regular fish eaters had 14 percent more gray matter.

“People have said for a hundred years that fish is brain food, and now we have more evidence that it could be good for health,” said Dr. William Harris a professor from the Sanford School of Medicine at the University of South Dakota in Sioux Falls.

“The twist in this study is that the researchers mention it didn’t look like the increase in the volume of gray matter in the brain was related to omega-3 fatty acid levels in plasma, but instead, related to fish intake,” Harris added. “Overall, it points in the same direction, which is to eat fish.”

Becker and his coauthors note that fish eaters tended to be more educated than the non-fish eaters and past research that found the same thing suggests that eating fish may reflect a generally healthier, more affluent lifestyle, which would also affect brain health.

Nonetheless, fish itself and omega-3 fatty acids have been found to be beneficial in their own rights by past studies as well, the authors write.

“Obviously not everyone likes fish, and there are substantial segments of the population, for example, vegetarians and vegans, for whom eating fish is not possible,” Becker told Reuters Health in an email.

“However, small changes, perhaps adding fish once a month, increasing to twice a month, eventually to the point where it's in the diet 1-2 times per week, is possible for many people,” he said.

“The most important overall message is that, (for older adults) the health of their brain when they are in their 70s or 80s is a consequence, in part, of how they have treated it until then. While it seems a long way off to 30-somethings, small changes now that can be maintained over 30-40 years will have a substantial payoff,” Becker added.

SOURCE: American Journal of Preventive Medicine

Biodiesel byproduct could combat cacao disease:

In Pennsylvania, scientists at Penn State’s Huck Institutes of the Life Sciences have found that glycerol from biodiesel production can act as a potential alternative to the hazardous antifungal agents currently being used to combat one of the most damaging cacao diseases, Phytophthora pod rot (also known as Black Pod), responsible for an estimated 20 to 30 percent loss in yield annually.

“When you make biodiesel,” researcher Mark Guiltinan says, “you end up with a massive amount of glycerol that nobody really has a good use for, and it’s super cheap because of that.”

Researcher Yufan Zhang adds that the production of glycerol from biofuels “is projected to increase ten-fold in the next ten years, as high as six times the projected demand, and people are already generating excessive amounts of glycerol that they don’t know what to do with. There are journals focusing specifically on the use of glycerol and other biodiesel products, and research is being done on all different kinds of byproducts from the biodiesel industry to find out what how these compounds could be used.”

Courtesy: Biofuel Digest

DHA Omega-3 Cures Periodontal Disease:

A recent Harvard report confirmed that DHA (docosahexaenoic acid) omega-3 supplements can substantially improve periodontal outcomes for individuals suffering from periodontitis.

Periodontitis is a severe gum infection that breaks down the soft tissue and bone that support the teeth. It is the second most common disease in the world with between 30 and 50 percent of the United States population suffering from it.

Omega-3 is linked to the potential anti-inflammatory DHA effects. Additionally, DHA supplements are associated with reduced pocket depth between the teeth and the gums and reduced gingival index, which is used to evaluate the extent of gum disease. There have been previous studies that confirmed a link between omega-3 fatty acids and potential dental health benefits.

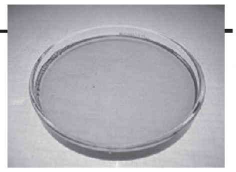
However, the anti-bacterial aspects of omega-3 fatty acids have been largely ignored. While there is evidence that at relatively low doses, DHA can inhibit oral pathogens growth, more research is needed. There is potential for DHA to find a place in the nutraceuticals market.

In the recent Harvard report, adults suffering from mid-range periodontitis took part in a double blinded parallel trial with a placebo control group. Participants were given either 2,000 mg of DHA daily or a soy / corn oil placebo that they took for three months. All of the participants also took 81 mg of aspirin daily.

In the DHA group, participants exhibited improved pocket depth and gingival index. They had increased red blood cell membranes between 3.6 and 6.2 percent while their placebo group counterparts had no measurable increases.

The DHA group also had notable reduction in interleukin-1 beta (IL-1beta) and inflammatory biomarkers C-reactive protein levels. The systemic CRP levels remained largely the same. These findings confirm that there is potential therapeutic efficacy for DHA in patients with periodontitis.

Courtesy: Harvard Scientists Report




Neem Oil

Introduction

Neem (Azadirachta indica A.]uss., Family: Meliaceae, Subfamily: Meliodeae, Order, Meliales) is an evergreen tree native to the Indian subcontinent. It also grows widely in several other countries of Asia, Australia, Africa and Central and South America. The tree grows on almost all kinds of soils including saline and alkali and the other wastelands. In Vedas, Neem tree is referred to "Sarva Roga Nirvarini" – one capable of curing every illness and ailments. Neem has been used in India since thousands of years and is used extensively in many Ayurveda medicines for its disease fighting properties.

Neem oil is obtained when pressed from the fruits and seeds of the neem (Azadirachta indica), Neem oil is a vegetable oil extracted from the fruits and seeds of Neem tree. The oil can be obtained through pressing (crushing) of the seed kernel and oil yield varies from 25% to 45%. The oil is light to dark brown in color depending upon its method of processing. It is very bitter in taste mainly because of its triterpenoid compounds. It is hydrophobic in nature; in order to emulsify it in water for application purposes, it must be formulated with appropriate surfactants.

Azadirachtin is the most well known and studied triterpenoid in neem oil. The azadirachtin content of neem oil varies from 300ppm to over 2500ppm depending on the extraction technology and quality of the neem seeds crushed. Nimbin is another triterpenoid which has been credited with some of neem oil's properties as an antiseptic, antifungal, antipyretic and antihistamine. Neem oil also contains several sterols, including (campesterol, beta-sitosterol, stigmasterol). Apart from minor constituents neem oil contains 24-54% oleic acid, 6-16% linoleic acid, 16-33% Palmitic acid and 9-24% stearic acid.

Minor Constituents

Neem contains a large number of chemically diverse and structurally complex bioactive tetranortriterpenoids commonly referred to as C-seco meliacins or limonoids. Some of the potential compounds include a number of azadirachtinoids, salannin, desacetyl salannin, nimbin, desacetyl nimbin, etc. The bioactivity related research on this plant has focussed on azadirachtin because of its abundance and unique mode of action. It does not knockdown or kill the insect instantaneously like most neurotoxic insecticides. Instead, it elicits physiological and behavioral responses in insects, which lead to their death.

The azadirachtinoids are a mixture of twelve closely related meliacins, which constitute 0.3 to 0.6% of seed kernel.

Azadirachtin is unstable to heat, light, water, pH, microbes, etc., because of which its effective life under field conditions is short. Several attempts have been made in the past to stabilize it either by structure modification or use of UV screens and other stabilizers. Its reduced derivatives, namely, dihydro- and tetrahydro-azadirachtin are more stable to light, heat, moisture, etc., and also retain the bioactivity.

A broad spectrum of activity against insects, phyto-nematodes, plant pathogens, etc., is exhibited with multifarious modes of actions. Worldwide, more than 500 pest species are controlled. Its multi-pronged effects against insects as repellent, antifeedant, oviposition deterrent, molting or growth disrupt or, sterilant, ovicide and oviposition deterrent help to effectively control a variety of farm and household insect pests and pathogens infesting agricultural, plantation and cash crops. In agriculture, neem products are valued for their effect as slow N-release materials and as nitrification inhibitor also.

Neem oil Benefits and Uses

1) Antiviral, Antibacterial and Antifungal

The neem absorbs viruses and prevents them from distributing to other regions of the body. It is reported that neem inhibits the growth of Dengue virus, a hemorrhagic fever related to Ebola, and interferes with the reproduction of the coxsackie B virus, one of a group of "enteroviruses" that are second only to the common cold as the most infectious viral agents in human beings.

Extracts from the neem oil along with the leaves reveal antibacterial and antiseptic benefits. Small scrapes and cuts can be treated with neem to prevent bacterial disease and redness.

Compounds in the neem are hazardous to fungus. It contain two compounds, nimbidol and edunin, which have antifungal properties.

2) Oral Health

Both oils and aqueous extracts of neem comprise strong antiseptic compounds; these may destroy the bacteria that cause cavities, halitosis, and gum disease. Neem's powerful antibacterial activity makes it a well-known ingredient in toothpaste, mouthwash, and oral health tonics.

3) Reproductive Health

Neem is a fairly powerful birth control agent as it reduces fertility in both women and men without affecting sexual performance or libido. Neem also functions as a spermicide and could prevent sexually transmitted infections when used as a vaginal suppository. Report in the American Journal of Reproduction indicates that purified extracts of neem contained immunomodulators that stimulate Th1 cells and macrophages that terminate pregnancies in rats, baboons and monkeys. Fertility was regained after one or two cycles with no apparent impact to future pregnancies.

Neem can treat excessive vaginal discharge, as well.

4) Arthritis

The Neem is a well known, powerful botanical treatment for osteo-arthritis and rheumatoid arthritis. It might help provide long term treatment for individuals with chronic debilitating conditions like fibromyalgia.

5) Insect Repellent

Neem provides a nontoxic, environmentally friendly option to chemical insect repellents and flea treatments. It efficiently repels lice, fleas, ticks, mites, ants, and mosquitoes. It is recommended for livestock, pets and people.

6) Cancer and Diabetes

There is proof that its use may reduce the demand for insulin, neem has healing implications for diabetes. Reportedly, neem reduced the demand for insulin dosage by 30 to 50 percent in a single team of individuals. With its extremely bitter properties, neem has been a cornerstone of Ayurvedic therapy for pitas, or disorders caused by overeating sweets. Some of the earliest reports on neem, dating back to a 1973 report in Medicine and Surgery (not available online), indicated that insulin requirements could be cut.

7) Anti-Inflammatory – Nimbidin, a component of neem, has been show to posses' potent anti-inflammatory and antiarthritis activity in both in vivo and in vitro settings. Researchers suggest that nimbiden suppresses the functions of macrophages and neutrophils involved in inflammation. Earlier research also documented neem's anti-inflammatory properties.

8) Antioxidant Compounds in Neem – Oxidative stress, the process through which free radicals are created, is a normal function of the body but the resulting molecules are unstable and can damage other cells. Researchers have associated a series of disorders, including cardiovascular disease, eye health, cataracts and macular degeneration, age-related neurodegeneration (decline of the brain and nervous system) and even cancer with high levels of free radicals. Antioxidants, including those found in vitamins A, C and E, provide the free radicals with electrons to minimize damage.

9) Liver Health – Throughout its long history, neem has often been recommended as blood cleanser. The truth of the matter may be it that helps protect the liver from damage, which in turn helps cleanse blood.

10) Neuroprotective Effect – A single study shows that indicates that antioxidant compounds in neem helped to prevent brain damage in rats who had suffered a stroke by enhancing lipid peroxidation and increasing ascorbic acid (Vitamin C) in the brain. Rats pre-treated with neem seemed to complete standard tests, including a water maze, better than the control group and blood parameters were significantly improved over the untreated rats.

11) Sexually Transmitted Diseases & Neem –One study funded through an agency of the US government found that neem provided 75% protection from the HIV virus to cells in a test tube and volunteers with AIDS who took neem for 30 days gained an average of three kilograms. Key chemical markers, including CD4+ cell counts, hemoglobin and platelet counts, also increased. A 1997 study at Johns Hopkins University also showed that neem provided significant protection against the herpes virus in mice.

12) Stress & Neem – A small number of animal studies indicate that low doses of neem leaf extracts have sedative effects comparable to those in diazepam – the active ingredient in Valium. Interestingly enough, that effect disappears at high doses, approximately 400 or 800 milligrams per kilograms of body weight.

13) Ulcers & Neem - One of the few recent clinical trials among humans using neem indicates that neem bark causes significant decreases in gastric acid secretion (77%), as well as gastric secretion volume (63%) and pepsin activity (50%) That research may be particularly important for people with arthritis or other chronic pain.

14) Benefits of Neem Oil for Skin and Hair - Neem oil is loaded with nutrients and is used in a variety of lotions, creams soaps and of course cosmetics. It protects skin from aging, fights acne, helps to reduce redness and inflammation, treats scar, can also be used as a face mask, helps to relieve eczema symptoms. it is effective on 14 different cultures of fungi.

It helps in controlling dandruff and maintains the scalp's PH level, prevents itchy scalp and psoriasis, promotes hair growth and strengthens hair from the roots, keeps hair smooth and hydrated, remove head lice, increase hair growth by removing split ends and stunted hair growth.

Side Effects

There are a few side effects of neem to discuss. Neem should not be used in infants. Those with any history of stomach illness or irregularities shouldn't use neem leaf based supplements. Those with any past or present liver or kidney issues should not use neem. Some individuals have reported experiencing a rise in fatigue levels when taking neem. Neem oil and other neem products such as neem leaves and neem tea should not be consumed by pregnant women, women trying to conceive, or children.

There is some evidence that internal medicinal use may be associated with liver damage in children. When used as directed, neem leaf and bark show very few signs of toxicity even at high levels. Neem oil, however, should not be used internally. High levels of neem (up to 320 grams per kilogram in rats) taken internally may result in damage to the thyroid, liver, and kidneys, although the organs showed significant recovery after 28 days. Neem also contains compounds similar to aspirin and should never be used in children with colds, fevers or flu.

There remains little scientific research to support opinions about the health benefits of neem, despite the fact that the medicinal uses for neem that are currently reported are quite convincing. Further research is required to reap full potential of neem and neem oil.

Laugh Out Loud

- When a snail crossed the road, he was run over by a turtle. Regaining consciousness in the emergency room, he was asked what caused the accident. "I really can't remember," the snail replied. "You see, it all happened so fast."
- **Dinosaur Bones**

  Some tourists in the Chicago Museum of Natural History are marveling at the dinosaur bones. One of them asks the blonde guard, 'Can you tell me how old the dinosaur bones are?'

  The guard replies, 'They are 3 million,four years, and six months old.'

  'That's an awfully exact number,' says the tourist. 'How do you know their age so precisely?'

  The guard answers, 'Well, the dinosaur bones were three million years old when I started working here, and that was four and a half years ago!'
- When NASA first started sending up astronauts, they quickly discovered that ball-point pens would not work in zero gravity.

  To combat this problem, NASA scientists spent a decade and $12 billion developing a pen that writes in zero gravity, upside down, underwater, on almost any surface including glass and at temperatures ranging from below freezing to over 300° C. Indians just use a pencil.
- **You are a Nerd If…**

  If you have more toys than your kids

  If you need a checklist to turn on the TV

  If your I.Q. number is bigger than your weight

  If you have introduced your kids by the wrong name

  If you can remember 7 computer passwords but not your anniversary

  If you have a habit of destroying things in order to see how they work

  If you rotate your screen savers more frequently than your automobile tires

  If the microphone or visual aids at a meeting don't work and you rush up to the front to fix it

  If you have a functioning home copier machine, but every toaster you own turns bread into charcoal

  If you have memorized the program scheduled for the Discovery channel and have seen most of the shows already
- Pauli arrived in heaven where he was allowed to ask God one question. Pauli said: "I want to see a theoretical derivation for the value of the fine structure constant". Soon an angel came back with a thick written tome which Pauli was supposed to return. Pauli studied the article, then asked for a pencil and wrote WRONG on the top of the first page.
- Pretty girl to Einstein : Can you not explain relativity in a simpler way so that even I can understand ?

  Einstein to pretty girl : If I guy sits next to you for an hour it will be like a minute....If he sits on a hot stove for a minute it `ll be like an hour
- If you want your study published:

  Send it to natural science journals if you understand what you've written and can test it.

  Send it to mathematical journals if you understand what you've written but can't test it.

  Send it to economics journals if you don't understand what you've written but can test it.

  Send it to philosophy journals if you don't understand it and can't test it.
- A pet shop is selling three very special monkeys and attracting a crowd of onlookers.

  The first one costs $5,000. Under the cage, a sign reads, "I know HTML and I'm very good with Photoshop."

  The second one costs $10,000. Under the cage, a sign reads, "I know C++, Assembly and Java."

  The third one costs $25,000, but there's no sign under his cage.

  Finally someone asks the shop owner, "What can that animal do that is worth $25K?"

  "That is a consultant monkey", replies the proprietor. "I don't know exactly what he can do, but he says he's worth it."
- **Noble gases**

  The teacher says to his chemistry class- "why is a Neon atom so lonely?" pupil says "because it's friends argon"
- **Computer Humor!**

  What does a baby computer call his father?

  Data.

  What is a computer`s first sign of old age?

  Loss of memory.

  What happened when the computer fell on the floor?

  It slipped a disk.

  Why was there a bug in the computer?

  It was looking for a byte to eat.

  What is a computer virus?

  A terminal illness.

  To err is human; but to really mess things up requires a computer.

  Computers make very fast, very accurate mistakes.

  The attention span of a computer is as long as its electrical cord.

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Member's PAGE

Cold - Press Technology for production of Pungent Mustard Oil

India is a larger producer of Mustard Seeds. There is no. of verities of mustard seed which are used for production of pungent mustard oil. These are Brassica Comprestros variety Yellow Mustard, Brassica Comprestros variety Sarso. , Brassica Comprestros variety Brown Sarso, Mixture Gazon , Brassica Composition variety Toria, Brassica Juncia , Laha and Tara – Mira. There is huge requirement of pungent mustard oil due to special food habits of North and Eastern part of our country.

Pungency means ALLYL ISO – THIO CYANATE (Chemical term for pungency) , should be in certain percentage in oil. Certain moisture and heat during the crushing are critical parameters for getting pungency in oil. These conditions activate the enzyme MYROSINASE present in mustard seed, which converts the GLOCOSINOLATES in the seed into ALLYL ISO – THIO CYANATE. This is an essential oil responsible for pungency in mustard oil. Ideally it should be approximately 0.25% as per market demand.

Pungency in Mustard oil

Pungency in mustard oil is on account of the: -

1). ALLYL ISO THIO CYANATE.
2). HYDROXY BENZYL ISO THIO CYANATE.
3). BUSENYL ISO THIO CYANATE.
4). PHENYL BENZYL ISO THIO CYANATE.
5). PROPENYL ISO THIO CYANATE.

These are all the minor constituents. There is glucoside present along with some enzyme which hydrolyses the glucoside and provides essential oil.

Glucoside - Sinigrin (Potassium Myrocene) hydrolysed under suitable conditions of Temperature, Moisture & Duration (Time).

The enzyme is Myrocene.

The enzyme is Myrocene.

$$C_3H_5NC\begin{cases} O\,SO_2\,OK \\ S\,C_6H_{11}O_5 \end{cases} + HOH \xrightarrow{\text{Myrocene}} C_3H_5NCS + HOSO_2OK + C_6H_{12}O_6 \text{ Glucose}$$

Potassium Myrocene.

$\boxed{\text{Glucoside} = C_{10}H_{16}O_8NS_2K}$

Pungent mustard oil is manufactured by **Kohlu + Expellers and Cold - Press Technology.** The Cold - Press Technology having some benefits as prescribed under.

The shortcomings of traditional Kohlu method

The Kolhu method is traditional and old technology which is neither energy efficient nor commercially viable. Moreover it is not environment friendly also (as wood is being used in this process). Because of many mechanical moving parts and wood, maintenance of Kohlu is very costly and time consuming. As the method involves lot of manual handling, hence it is not hygienic. The space and energy used in this method are also on higher side.

Cold - Press Technology and Salient features

In this technology mustard oil is extracted with cold expellers without use of traditional Kohlu. The important features of this technology are

SAFETY:

In traditional KOLHU method in a bucket one wood plank is revolving along with one iron rod, and material is taken out by hands manually. It is very prone to accidents.

ENERGY SAVING:

As compared to traditional Kohlu plant, same capacity plant requires less power and provides maximum output.

HYGIENE:

As compared to traditional Kohlu plant proper hygiene is there in Cold - Press plant due to the process, being perfectly automatic and material handling is such that hygiene is maintained.

ENVIRONMENT FRIENDLY:

In traditional KOLHU method wood is being used and on an average one pair KOLHU uses 2 trees in a year. In India there are approximately 1 lac KOLHU pair working in almost 25000 oil mills. As a rough calculation they use 2 lacs trees every year.

Comparative analysis of Cold Press and Kohlu on per ton basis (4 crush system)

Parameters	Cold Process	Kolhu	Benefits of Cold Process
Power	68 Units	78 Units	Power cost almost 25% Less
Labour	Rs. 70.00	Rs. 120.00	Labour cost almost 50% Less
Maintenance	Rs. 15.00	Rs. 40.00	Maintenance cost almost 80% Less
Pungency	0.28 to 0.32	0.25 to 0.28	High Pungency in all seasons
Pungency retaining	Very good	Good	Certified by lab for retention
Capacity utilization	85%	65%	Always running on almost 100% capacity
Environment Friendly	Yes	No	Fully environment friendly plant
Hygiene	Yes	No	Fully hygienic
Space	Almost 50% of Kolhu		Saving on civil and shed work
Automation	Yes	No	VFD,sensors,Other automation option
Plant cost	Same as Kolhu		Capital cost same hence ROI is feasible

Crushing System

If plant is equipped with appropriate rating solvent plant then we need to crush seed 6 times to get desired level of oil in cake. In 6 crush system analysis rating will differ from above table, but cost wise, still it would be less than the traditional kolhu method. In such case residual oil in cake would be 6.0 to 7.0%.

Technical advantages of Cold Press Technology

- Made of fabricated steel, no casting is there in machine, providing very high strength.
- Jacket made of SS which is duly insulated.
- Foots conveyor at the bottom to lift the foots automatically to feed again to kettle, making system hygienic and efficient.
- VFD control panel for power saving.
- Equipped with best class one efficiency motors with VPI and roller bearings.
- No foundation required.
- Worm changing and chamber setting is very easy because of split chambers which come out horizontally.
- Equipped with pneumatic gates and sensors to control the flow of seed from feed conveyors.
- Equipped with pungency succession outlets to keep environment cozy.
- Fully covered machine for hygiene and good working conditions.

(M C Pandey, Vice President
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