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ORAL COMMUNICATIONS

ASSOCIATION OF PLASMA MARINE OMEGA 3 FATTY ACIDS WITH WHITE MATTER HYPERINTENSITIES IN THE OLDEST OLD. G.L. Bowman, L. Silbert, J. Shannon, L. Shinto, J.A. Kaye, J.F. Quin *(Dept. of Neurology, Oregon Health & Sciences University, Portland, USA)*

Background: Docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) are long chain omega 3 fatty acids which are thought to promote vascular health though anti-inflammatory and anti-atherosclerotic plaque mechanisms. MRI derived white matter hyperintensities are considered evidence of small vessel cerebrovascular disease, which may increase risk for cognitive decline. Methods: A cross-sectional study of plasma omega 3 fatty acid levels and MRI derived white matter hyperintensity (WMH) brain volumes was conducted in 40 community dwelling participants (aged 85 – 101 years) in the Oregon Brain Aging Study (OBAS). The average fasting period before blood draw was 3 hours and MRI was conducted within 1-month proximity to the blood collection. Plasma fatty acids were determined with the use of gas chromatography equipped with flame ionization detector. REGION image analysis software was used for total WMH volume quantification. Multivariate regression analyses were performed to assess the relationship between plasma DHA and EPA with WMH volumes. Results: Subjects were mean age 93 (± 3.8) years, 28 (70%) were women, and 5% were carrying an ApoE-e4 allele. Average MMSE score was 27 (± 3). Log plasma DHA and EPA content were both significantly, inversely associated with WMH after adjustment for age, gender, education, ApoE - 4 genotype, BMI, blood pressure, creatinine, fasting duration, MMSE, Hachinski ischemic score, and intracranial volume (DHA, p = .009, EPA, p = .017). DHA and EPA association with WMH was maintained after further adjustment for other vascular risk factors including plasma total cholesterol, LDL, and homocysteine (DHA, p = .006; EPA, p = .017). Conclusion: Both plasma DHA and EPA have strong inverse associations with white matter hyperintensities in the oldest old. This relationship is independent of other established vascular risk factors, including blood pressure, lipid profile and plasma homocysteine. These data suggest that these long-chain, highly unsaturated omega 3 fatty acids may offer cerebrovascular protection in addition to other established risk factors. Acknowledgements: NIH-NCCAM K23 AT004777 (GLB), NIA AG08017 (JAK).

MEDICAL NUTRITION IN ALZHEIMER'S DISEASE: THE SOUVENAID® CLINICAL TRIAL PROGRAM. P.J. Kamphuis[1], P. Scheltens[2], T. Hartmann[3], H. Soininen[4] *(1. Danone Research, Wageningen, The Netherlands; 2. Alzheimer Centre, Vrije Universiteit Medical Center, Amsterdam, The Netherlands; 3. Saarland University, Homburg/Saar, Germany; 4. School of Medicine University of Eastern Finland, Kuopio, Finland)*

Background: Many epidemiological studies indicate a clear link between nutrition and Alzheimer's Disease (AD). Several nutrient deficiencies have been shown to be risk factors for AD. Prospective studies with nutrients, like omega-3 fatty acids or the Mediterranean diet, show a reduced risk of developing AD. More than a decade of research into the role of nutrients in AD have resulted in the development of a new medical food Souvenaid® containing a specific combination of nutrients (Fortasyn™ Connect) designed to improve synapse formation. Methods: The effect of Souvenaid on memory (WMS-r delayed verbal memory) and cognitive performance (13-item modified ADAS-cog) was recently assessed in a proof-of-concept study (Souvenir I, #ISRCTN72254645) with 212 drug-naïve mild AD patients (MMSE 20-26). This proof-of-concept study showed that oral nutritional supplementation with Souvenaid given for 12 weeks improves memory in patients with mild AD (Scheltens et al, 2010). To confirm and further strengthen the results of this first study with Souvenaid, 3 additional trials were designed and started in 2009. All trials are registered with the ICMJE compliant Dutch trial register (www.trialregister.nl). In the US, the 'S-Connect' study (NTR1683), a 24-week randomised controlled double-blind study in 500 mild-to-moderate AD patients (MMSE 14-24) using AD medication started in approximately 45 sites assessing the effect on cognitive performance (ADAS-cog). In Europe, two studies also began in 2009 - The 'Souvenir II' study (NTR1975), a 24-week randomised controlled double-blind study in 226 drug-naïve mild AD patients (MMSE ≥20) started in approximately 30 centers aiming to assess the effect on memory performance (NTB - memory domain); and the EU-funded* 'LipiDiDiet' study (NTR1705), a 24-month randomised controlled double-blind study in 300 prodromal AD patients (according to Dubois et al, 2007) started with the aim to assess the effect on memory performance (modified-NTB). Results: The first trial of the Souvenaid Clinical Development Program took place between 2006 and 2008. The results of this trial demonstrated proof-of-concept. Conclusions: To further build the evidence base for the benefits of Souvenaid, a full clinical trial program was designed and 3 additional trials started in 2009. Results are expected to be available between 2011 and 2013. * Part of the research leading to these results has received funding from the EU FP7 project LipiDiDiet, Grant Agreement N° 211696.

ESTIMATION OF LEAN BODY WEIGHT IN OLDER BLACK AND WHITE MEN AND WOMEN: THE HEALTH, AGING, AND BODY COMPOSITION STUDY. S.J. Mitchell[1,2], C.M.J. Kirkpatrick[3], A.B. Newman[4], S. Satterfield[5], A.V. Schwartz[6], E.M. Simonsick[7], S.N. Hilmer[1,2] for the Health, Aging, and Body Composition Study *(1. Sydney Medical School, University of Sydney, Sydney, NSW, Australia; 2. Departments of Clinical Pharmacology and Aged Care, Royal North Shore Hospital, Sydney, NSW, Australia; 3. School of Pharmacy, The University of Queensland, Brisbane, QLD, Australia; 4. Division of Geriatric Medicine, University of Pittsburgh, Pennsylvania, USA; 5. Department of Preventive Medicine, University of Tennessee, Memphis, TN, USA; 6. Department of Epidemiology and Biostatistics, University of California San Francisco, San Francisco, CA, USA; 7. Clinical Research Branch, National Institute on Aging, Baltimore, Maryland, USA)*

In older people, decreased lean body weight (LBW) and increased total body fat affect pharmacokinetics. A semi mechanistic equation to estimate LBW using height, weight and sex was recently developed (Janmahasatian et al. Clin Pharmacokinet 2005; 44:1051-65). This study examined the ability of the LBW model to predict dual energy x-ray absorptiometry derived fat free mass (FFMDXA) in community dwelling older people across different sex, race and body mass index (BMI) subgroups. De-identified data was analysed from baseline measurements on participants in the Health Aging and Body Composition Study (Newman et al. JAGS 2003; 51:323-30) with complete relevant data (n=2963/3075, age 73 ± 3years). The ability of the LBW equation to accurately predict FFM was determined by agreement with FFMDXA using Bland-Altman plots and precision and bias. Bland-Altman plots demonstrated good agreement between LBW and FFMDXA with a mean difference (limits of agreement) of -1.54 kg (-7.62kg, 4.54kg) [white males -3.4kg (-9.0, 2.2kg), black males -1.7kg (-7.9, 4.5kg), white females -1.1kg (-5.5, 3.3kg) and black females 0.5kg (-4.7, 5.7kg)]. The LBW equation over-estimated FFMDXA for white males, black males and white females with mean errors (ME; 95% CI) of -3.4kg (-3.3, -3.6kg), -1.7kg (-2.0, -1.6kg), and -1.1kg (-1.2, -1.0kg) respectively. The LBW equation underestimated FFMDXA for black females with a ME of 0.5kg (0.4, 0.6kg). Results were consistent across normal, overweight and obese BMI subgroups. FFMDXA can be estimated easily from the LBW equation using weight, height and sex, with good agreement in this population of older people. Further studies are needed to determine the clinical utility of this equation for calculation of drug doses.

OUTCOME OF A TARGETED NUTRITIONAL INTERVENTION ON NUTRIENT INTAKES AMONG OLDER ADULTS WITH EARLY-STAGE ALZHEIMER DEMENTIA: THE NUTRITION INTERVENTION STUDY. B. Shatenstein, M.-J. Kergoat, I. Reid, M.-E. Chicoine *(Département de nutrition, Université de Montréal, Centre de recherche, Institut universitaire de gériatrie de Montréal. Montréal, Qc Canada)*

Introduction: Poor intakes of energy and certain nutrients are frequently observed among older adults with early stage Alzheimer dementia (AD) possibly increasing the risk of frailty in these individuals. Objective: To assess nutrient intakes among physically-well, community-dwelling adults with AD who received nutritional assessment and dietary counselling. Methods: Subjects aged 70y or older with a diagnosis of early stage AD were recruited in six hospital-based memory and geriatric clinics with their main caregiver. They participated in a 6-month quasi-experimental pre-post dietary intervention (T1, T2). Intervention patients (n=34) were compared to controls (n=33) having the same characteristics. Results: Intakes of energy (1631 ± 388 vs. 1780 ± 431 kcal, $p<0.05$), total fat (54 ± 16 vs 67 ± 23g, $p<0.001$), mono- (20.5 ± 7.2 vs 25.0 ± 9.2g, $p<0.05$) and polyunsaturated fats (9.5 ± 3.9 vs 12.5 ± 6.5g, $p<0.05$) and calcium (826 ± 324g, $p<0.05$) were higher at T2 in the intervention group, with no change observed in controls; omega-3 fatty acids tended to increase at T2 in intervention patients and decrease in controls. While not significant, nutrition risk assessed by the Elderly Nutritional Screening tool (ENS) decreased in the intervention group and increased among controls, mainly in males. Adequacy of protein intakes (as 1.0g protein/kg body weight/day) increased from T1 to T2 in intervention group women but decreased in female controls: at T1, 45.5% of the former met their protein needs while 81.1% attained adequacy at T2 ($p<0.05$), compared to 64.3% and 46.2% at T1 and T2, respectively, among controls ($p<0.05$). Differences in various parameters within and between groups were noted by sex and age. Conclusions: The nutrition intervention had a positive impact on dietary intakes and led to better nutrient profiles for the targeted nutrients. Longer follow-up will be necessary to determine persistence of benefits in this population.

the impact of a multidisciplinary intervention targeting physical activity and nutritional protein supplementation, on the incidence of a variety of objective and subjective measures among frail elderly people. Methods and Design: A total of 120 elderly people aged 70 – 85 years at risk of malnutrition assessed by Mini Nutritional Assessment (MNA) and elevated risk of disability measured by Short Physical Performance Battery score (SPPBC) will be recruited to participate to a four arms randomized controlled trial, comparing resistance exercise training, nutritional protein supplementation, both interventions, and neither in over a three months period. The participants will be followed over a 12-month period. Results: Results from this study can lead to significant cost saving, better HRQL, decreased morbidity, medication and hospitalisation of the elderly population. Moreover, the results may create a new approach to routine clinical practice and can be applied routinely in the treatment of older people at risk for feature functional decline and hospitalization.

STRATEGIES FOR OVERCOMING THE ANABOLIC RESISTANCE OF MUSCLE PROTEIN SYNTHESIS (MPS) AND MUSCLE PROTEIN BREAKDOWN (MPB) TO ESSENTIAL AMINO ACIDS (EAA), INSULIN AND EXERCISE IN THE ELDERLY. V. Kumar[1], E.A. Wilkes[1], B. Phillips[1], W. Hildebrandt[1], A. Selby[1], R. Patel[1], D. Rankin[1], J. Williams[2], P. Atherton[1], K. Smith[1], N. Hiscock[3], M.J Rennie[1] *(1. University of Nottingham, SGEMH, Derby, DE22 3DT, 2. Anaesthetic Department, Derby Hospitals NHS foundation Trust, Derby, 3. Unilever Discover R & D, Colworth Science Park, Sharnbrook, MK44 1LQ, UK)*

We have now measured the response of MPS to i) increasing the volume of exercise postprandially, (ii) feeding immediately after exercise and iii) the response of MPB to insulin at fixed EAA availability. For (i) we studied 21 young (25±5 y) and 21 elderly (69±3 y) men (all BMI 22-26 kg.m-2) who performed 6 × 8 repetitions of full cycle isotonic unilateral leg extension at 75% 1RM either fasted or (ii) followed by a 325 ml drink (Slim-Fast optima (SFO,10 g PRO, 24 g CHO) with or without 4.2 g of leucine (Leu) supplementation. For (iii) 2 groups of 8 (4M and 4F) young (24.5±1.8 y,) and elderly (65±1.3 y) men and women (all with BMI 22-26 kg/m²) were studied with a euglycemic, isoaminoacidemic clamp at 5 and15 μIU insulin.ml-1. MPS was measured by incorporation of [1,2 13C2]Leu and MPB by arteriovenous dilution of [d5]phenylalanine. The phosphorylation of signaling proteins in the mTOR pathway was measured using western analysis. In postabsorptive young men, doubling exercise volume produced no additional MPS response but in older men it resulted in enhancement of both MPS and p70S6K responses ($P<0.05$), to values like those in the young. Feeding Leu-enriched drinks immediately after exercise also rejuvenated the MPS and p70S6K responses to become identical to those in younger men ($P<0.05$). Increasing insulin availability reduced MPB by around 50% in the young ($P<0.05$), but in the elderly it was unaffected ($P>0.05$), but resistance exercise improved muscle glucose metabolism markedly. We conclude that the progressive inability of older people to maintain muscle mass is related to anabolic resistance of MPS to both EAA and exercise and MPB to insulin. However, this can be partially ameliorated by increasing the volume of exercise at 75% 1RM and can be abolished by feeding a leucine-enriched protein drink immediately after exercise. Supported by BBSRC and Unilever plc.

THE EFFECT OF HIGH-SPEED POWER TRAINING VS. TRADITIONAL SLOW-SPEED RESISTANCE TRAINING ON MUSCLE PERFORMANCE IN OLDER MEN AND WOMEN. S.P. Sayers, K. Gibson, M.A. Minor *(Department of Physical Therapy, University of Missouri, Columbia, MO, USA)*

Objectives: High-speed power training improves peak muscle power in older adults; however, different functional tasks may benefit from improvement of muscle power at values other than "peak", e.g., tasks requiring a greater velocity or force component. Our objective was to examine how two different resistance training (RT) protocols impact muscle performance across a broad range of resistances typically encountered during daily tasks. Methodology: 53 older adults (18m, 35f; Age=68.9±6.6yrs; Ht=170.6±10.3cm; Wt=81.5±17.9kg) were randomized to high-speed power training at 40% one-repetition maximum (1RM) (HSPT: n=20; 3 sets of 12-14 repetitions), slow-speed RT at 80%1RM (SSRT: n=20; 3 sets of 8-10 repetitions) or control (CON: n=13; stretching) 3x/week for 12 weeks. Leg Press (LP) 1RM and LP peak power (PP), peak power velocity (PPV), peak power force (PPF), and overall peak velocity (VEL) were obtained at 40%-90% 1RM at baseline and 12 weeks using Keiser pneumatic RT equipment (Fresno, CA). Perceived exertion (RPE) was obtained following each set using Borg's scale and total daily work was calculated. Results: LP 1RM increased 20% and 26% in HSPT and SSRT, respectively, compared to CON (ANOVA; $p<0.05$), but were not different from each other (ANOVA; $p>0.05$). Changes in PP, PPV, and VEL from 40%-90%1RM were improved in HSPT and SSRT compared to control (ANOVA; all $p<0.05$); however, HSPT demonstrated greater improvements at lower resistances (~40%-60% 1RM) compared to SSRT (ANOVA; $p<0.05$). There was no difference in daily work (HSPT: 6567±2821 vs. SSRT: 5896±3298; $p>0.05$) and RPE was lower in HSPT (11.9±1.6 ["light" to "somewhat hard"]) compared to SSRT (14.5±1.8 ["somewhat hard" to "hard"])($p<0.05$). Discussion: Comparable improvements in muscle strength can be obtained with HSPT or SSRT; however, power- and speed-related muscle performance characteristics showed greater improvement at lower resistances with HSPT. Because RPE is lower, HSPT may be more appealing than SSRT in this population. Supported by grants from National Institutes of Health / National Institute of Aging (#R03AG025141-02), American College of Sports Medicine, the Arthritis Foundation, and American College of Rheumatology.

VISUALIZATION OF EVALUATION AND MANAGEMENT OF THE 'NUTRITION PROCESS' IN INDIVIDUAL ELDERLY, MULTIMORBID PATIENTS. G. Akner *(Dept. Of Geriatric Medicine, Örebro University Hopsital, Örebro, Sweden)*

Background: Elderly, multimorbid patients often have nutrition-related problems caused by perturbed intake/uptake and/or metabolism of food (energy, nutrients, water). However, there is a big gap between on the one hand scientific evidence, national guidlines and local management programs and on the other hand how little nutrition information is documented and actually used in the management of individual elderly patients. Many years of clinical research, repeated published recommendations and educational programs have not improved the situation substantially. One major reason for this is that the fragmented design of the medical record does neither facilitate an overview of patients´ health problems and how they develop over time, nor allows an easy visualization of the 'nutrition process'. Method: We have delevoped an 'interactive health analysis system' that allows for cross-sectional and longitudinal overview of all kinds of subjective and objective health variables and treatment program components. All quantified variables such as symptom scores, graded diagnose scores, risk factor scores and all kinds of test results (lab-tests, rating scale scores etc) may be freely selected and visualized over time. In this way, nutrition related symptoms, diagnoses and treatment components and relations between them may be easily visualized. Any variable in the system may also be selected as a quality indicator within the regular medical record and transferred to a quality register. A multimorbid elderly patient will be presented and the regular health information in the conventional medical record will be transformed into a multimorbidity matrix with emphasis on overview of nutrition aspects. Discussion: The proposed 'interactive health analysis system' provides a means for how the 'nutrition process' may be visualized in individual multimorbid elderly patients over time as an 'overlay' within a multimorbidity matrix. This will i) improve integrated, multidomain health analysis, assessment and management of individual patients over time, ii) stimulate interest in nutrition-related matters serving as a key component in clinical education and training and iii) allow clinical research on e.g. nutrition- related matters directly within the regular health records.

ASSESSING THE VALIDITY OF A FOOD FREQUENCY QUESTIONNAIRE ON MIDLIFE DIET OF THE ELDERLY. T. Eysteinsdottir, L. Steingrimsdottir, I. Thorsdottir, I. Gunnarsdottir *(Unit for Nutrition Research, Landspitali-University Hospital & Faculty of Food Science and Human Nutrition, University of Iceland, Reykjavik, Iceland)*

Objectives: Limited information exists on the validity of dietary information given by elderly people on their past diet. The aim of this study was to test the validity of a food frequency questionnaire on remote diet (AGES-FFQ), used in the AGES-Reykjavik Study, an epidemiological study of older individuals.Design: Data was collected both at present time and retrospectively. Food intake was estimated using the AGES-FFQ on remote diet among 56-72-year-old subjects. Results were compared with detailed dietary data gathered 18-19 years previously, i.e. in midlife. Spearman correlation and cross-classifications were used to assess the ability of the AGES-FFQ to rank subjects according to their intake. Setting: Nationwide, Iceland. Participants: Subjects were participants of the 1990 Icelandic National Dietary Survey, born 1937-1952 (n=174). Measurements: Dietary intake, estimated by the AGES-FFQ (2008-2009) and dietary history (from the year 1990) as a reference method. Result: The strongest correlation between the AGES-FFQ and the reference method was found for cod liver oil, $r=0.53, p=<0.001$ and $r=0.58, p=<0.001$, for men and women respectively. For milk and dairy products the corresponding correlation coefficients were $r=0.41, p=0.001$ and $r=0.29, p=0.004$. The correlation coefficients were lower, but within an acceptable range ($r=0.21$-0.37) for meat, fish, potatoes, and oatmeal/muesli in both genders, as well as fresh fruits for women and whole-wheat bread and blood/liver-sausage for men. No correlation was found between the AGES-FFQ and the dietary history for rye bread and vegetable consumption. Subjects were categorized into five groups according to level of consumption by the two methods. Cross-classification showed that between 19-55% were classified into same group and 47-87% into same or adjacent group. Between 1-13% were grossly misclassified into opposite group. Conclusion: The AGES-FFQ on midlife diet was found to be able to rank individuals according to their intake of several important food groups.

APOLIPOPROTEIN GENOTYPES AND DIETARY FAT INTERACT TO DETERMINE PLASMA LIPOPROTEIN LEVELS IN BRAZILIAN ELDERLY WOMEN. R.S. Paula[1], V.C. Souza[1], C.F. Moraes[2], A.L. Benedet[3], E.R. Souza[1], J.O. Toledo[1], C. Córdova[1], O.T. Nóbrega[3] *(1. Catholic University of Brasília (UCB), Brasília-DF, Brasil; 2. Geriatrics Service, Hospital of the Catholic University of Brasília (HUCB), Brasília-DF, Brasil; 3. University of Brasília (UnB), Brasília-DF, Brasil. E-mail: otavionobrega@unb.br)*

Introduction and objective: Studies show that genetic polymorphisms in apolipoproteins, which are in charge of lipid transport, predispose to atherogenic dyslipidemia. This study aimed to investigate the impact of apolipoprotein E, A5 and B genotypes and dietary intake on lipid profile in a sample of elderly women in Brazil. Methodology: Two hundred and fifty-two women (60 years or older) living in the outskirts of the Brazilian Federal District underwent clinical and laboratory assessments to characterize glycemic and lipidemic variables, and also to exclude confounding factors (smoking, drinking, hormone replacement, cognitive impairment, physical activity). Three-day food records were used to determine usual dietary intake, whereas genotypic

25(OH)D observed was 69.9 ng/ml. At baseline, PTH was negatively correlated with 25(OH)D; $p < 0.001$, however, no effect of vitamin D supplementation on PTH was observed over the four months of study. At baseline, BMI, total body mass, fat mass and lean mass were negatively correlated ($p < 0.05$) with 25(OH)D. However, with vitamin D fortification the four-month change in 25(OH)D was unrelated to total body mass, fat mass or lean mass. Discussion: Food fortification safely improves vitamin D status; the 25(OH)D increase with fortified food (~6-7 ng/1,000 IU vitamin D3 daily) is similar to that reported with daily use of vitamin D supplements. Fortification will need to exceed 2,100 IU vitamin D daily to assure adequacy for all women. Simple approaches, e.g., larger doses for people of higher BMI, seem unlikely to assure optimal vitamin D status unless the daily intake is "high." Additional study is needed to understand the mechanism(s) underlying the differences in 25(OH)D response to oral vitamin D intake.

NUTRITIONAL SUPPLEMENT COMBINATION THERAPY FEASIBILITY, SAFTEY AND BIOMARKER CLINICAL TRAIL IN COGNITIVELY NORMAL ADULTS. N.B. Emerson Lombardo[1], L. Volicer[4], S.H. Auerbach[1], W. Matson, S. Matson, J. Valla[2] *(1. Neurology, Boston Univ. Sch. Medicine, Boston; 2. Veterans Administration Medical Center, Bedford, MA; 3. A, Univ S Fla, Tampa, United States; 4. Barrow Neuro. Inst., St. Joseph's Hosp.& Med Center, Phoenix, USA)*

Secondary and tertiary nutrition prevention efforts are limited for older adults living in the community. Such programs are minimally funded by various government levels and there appears to be a lack of concern around the nutritional health of this growing segment of the population. Nutrition risk screening in the community can: 1) raise awareness of older adults of their potential nutrition problems, 2) raise awareness of health and service professionals as well as government bodies, 3) help to identify key areas of concern, 4) be used to map out a care process for older adults found to be at risk, 5) aid in informed decision making around interventions and treatments, and 5) be used to monitor the benefits of preventive efforts. Several studies that have involved nutrition risk screening conducted by the author's research group will be highlighted to demonstrate the wide applicability of this activity in community prevention efforts. Selected process evaluation results of the Bringing Nutrition Screening to Seniors in Canada and Evergreen Action Nutrition programs will be presented. Outside of a nutrition care process, nutrition screening has considerable value and needs to be included in a wide variety of settings and practitioner care and service processes. Screening as a means of early identification can promote secondary and tertiary prevention for older adults and is currently and underused process in the community. (Keller HH, Hedley MR, Wong SS-L, Vanderkooy P, Tindale J, Norris J. Community organized food and nutrition education: participation, attitudes, and nutritional risk in seniors. J NutrHealth Aging 2006; 10(1):15-20; Keller HH, Haresign H, Brockest B. Bringing Nutrition Screening to Seniors (BNSS) Process Evaluation. Can J Diet Pract Res 2007;68(2): 86-91; Keller HH. Promoting food intake in older adults living in the community: a review. App Phys Nutr Met 2007;32: 991-1000).

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