Sports Nutrition for Vegan Runners

Phil Woodbridge MSc BA(Hons) SENr
### What are Vegans?

<table>
<thead>
<tr>
<th></th>
<th>Grains/Fruits/Vegetables</th>
<th>Dairy</th>
<th>Eggs</th>
<th>Fish/Seafood</th>
<th>Meat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegan</td>
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<tr>
<td>Lacto-vegetarian</td>
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<tr>
<td>Ovo-vegetarian</td>
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<tr>
<td>Lacto-ovo-vegetarian</td>
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<tr>
<td>Pescetarian</td>
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<tr>
<td>Omnivore</td>
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Why Vegans?

➢ 2% of adults and children vegetarian (Bates, 2014)

➢ Latest research 6% vegetarian, 4% pescatarian, 2% Vegan (The Grocer, 2018)

➢ 500,000 vegans in the UK (Vegan Society, 2016)

➢ Up by 3 times in 8 years
Who is going Vegan?

- 25% British people drinking plant-based milks (Mintel, 2019)
- Fewer 16-25 year olds buying cows milk
- Health (37%), environmental (36%) and ethical factors
- Market impact
Vegan Runners?

- Vegan Runners UK – 500+ Members up to >4,000 since 2016
- Improve performance?
- Nutritionally balance?
- Very few studies
- Worth investigating
Vegetarian and athletic performance?

- Systematic review 8 studies (Craddock et al., 2015)
- Neither hinders nor improves performance (Nieman, 1999)
- Suitable alternative for runners (Nebl, et al. 2019)
- Appropriate and equal alternative (NURMI Study 2018, QOL score)
- Results equivocal
Vegan Diet Nutritional Quality

- Cross-sectional studies (Clarys et al. 2014; Elorinne, et al. 2016)
- Low intake energy, protein, calcium, vitamin $B_{12}$ and D
- Low serum D3, iodine and selenium
- High CHO and fibre
- Better fat profile
- Healthiest but nutritional guidance
Recommendations for athletes

➢ Reference Nutrient Intakes (RNI)

➢ Glycogen depletion and dehydration (Sawka et al. 2007)

➢ Protein for recovery (Moore et al. 2014)
Vegan Energy Intake

➢ Difficult to consume
➢ Runners higher energy needs
➢ Low energy suppresses immunity (Loucks et al., 2011)
➢ Relative Energy Deficiency in Sport (RED-S)
➢ The Female Athlete Triad
➢ Vegetarian- Disordered eating (Martins et al., 1999)
Vegan Protein Quality

- Cross-sectional study (Kniskern and Johnson, 2011)
- 0.8 → 1.0 g/kg
- Protein bioavailability
- Protein intake 10-12% (Messina and Messina, 1996)
Vegan Nutritional Considerations

➢ Iron – Non-haem vs Haem
➢ Zinc - bioavailability
➢ Vitamin $\text{B}_{12}$ – fortified foods
➢ Calcium
➢ Vitamin D
➢ Riboflavin

(Fuhrman and Ferreri, 2010; Venderley and Campbell, 2006)
Vegan Runners Research

➢ Nutritional deficiencies versus RNI?
➢ Deficiencies versus recommended intakes for athletes?
➢ Male vs female?
➢ Vegan diet plans
Vegan Runners Research Hypothesis

- Low protein
- Low micronutrients
- Vegan diet plans address deficiencies
Vegan Runners Recruitment

➢ Vegan Runners UK
➢ 50% Male/Female
➢ Email
➢ Facebook
Vegan Runners Study Design

- 3 day food diary – 2 training/running, 1 rest day
- Vegan Lifestyle Questionnaire (Dyett et al. 2014)
Mean (±SD) demographic profiles of all (n=30), male (n=15) and female (n=15) participant vegan runners
Vegan Runners Lifestyle

- **Degree Level Education**: 60%
- **Exercise >3/week**: 96%
- **Nutritional Supplements**: 80%
- **2 Snacks/day**: 53%
- **3 Meals/day**: 77%
Nutritional Targets

➢ Energy Expenditure – 2554 kcal (BMR x PAL + MET*)
➢ Protein – 1.4g/kg (Bean, 2003; American College of Sports Medicine, 2009)
➢ CHO – 5g/kg (Burke & Maughan, 2012)
➢ Micronutrients – RNI (Dept of Health 1991)

* Ainsworth et al., 2011
Macronutrient Results

➢ EI sig. lower than target 80%
  Males (t = -3.265) and Females (t = -3.334)

➢ Protein intake sig. lower than target 87%
  Males (t = -3.559) and Females (t = -4.361)*

➢ CHO sig. lower than target
  Females (t = -3.630)

➢ Fat sig. lower than target
  Males (t = -3.560)

* Research hypothesis supported p < 0.05
Micronutrient Results

- Vitamin D sig. lower than target
  Males and Females (p < 0.05) – 80% males, 78% females

- Selenium sig. lower than target
  Males and Females (p < 0.05) – 60% females, 93% males

- Iron intake below? – Higher target (ADA, 2009), Bioavailability

- Zinc intake below? – Bioavailability

- Vitamin B$_{12}$? – Bioavailability

- Calcium? – 53% Females below
  Female Athlete Triad

- Iodine – 93% below

Research hypothesis supported
Diet Plans

Food Diary Intake

- CHO: 34.30%
- Protein: 13.2%
- Fat: 1.40%
- Alcohol: 51.1%

Target Intake

- CHO: 55%
- Protein: 15%
- Fat: 30%

Protein intake:
- 1.1g/kg
- 1.4g/kg

CHO intake:
- 4.6g/kg
- 5.0g/kg

Calories:
- 2219
- 2554
<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Food sources for vegan runners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total energy</td>
<td>Improve overall energy intake by eating more frequent meals, including snacks. Include more meat alternatives, dried fruit, nuts and seeds with a focus on energy-dense, lower fibre foods.</td>
</tr>
<tr>
<td>Protein</td>
<td>Ensure food combinations supply all essential amino acids including; rice and beans, beans on toast, hummus with tahini, lentils and rice, tofu, vegetable burgers, tempeh. Aim for all meals to supply 20g of protein to aid recovery</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>Look to include fortified cereals and soya products</td>
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<tr>
<td>Selenium</td>
<td>Add brazil nuts and cereals.</td>
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<tr>
<td>Iron</td>
<td>Include leafy green vegetables as well as fortified food such as soya milk, beans and cereals. Consume Vitamin C for improved absorption.</td>
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<tr>
<td>Zinc</td>
<td>Add beans, nuts, seeds, peas as well as fortified cereals and soya products.</td>
</tr>
<tr>
<td>Vitamin $B_{12}$</td>
<td>Use nutritional yeast, yeast extract, fortified soya products.</td>
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<tr>
<td>Calcium</td>
<td>Include green leafy vegetables, calcium fortified foods such as soya and rice milk, and cereals.</td>
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<tr>
<td>Iodine</td>
<td>Seaweed, iodized salt, and supplements</td>
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</tbody>
</table>
Conclusions

➢ Intakes of energy, protein, CHO, fat, vitamin D and selenium below RNI and recommended targets
➢ Intakes of iron, zinc, vitamin B₁₂, calcium and iodine may also be insufficient due to reduced bioavailability
➢ Diet plans can address inadequacies
➢ Vitamin D and iodine may require supplementation
➢ Future research could assess impact on nutritional status, protein quality and usefulness of the diet plans produced
Vegan Products Marketing Potential?

- Energy dense products
- Plant-based protein supplements
- Natural products
- Creatine and beta-alanine supplementation?
- Vegan Society endorsement
PHIL WOODBRIDGE  MSc BA (Hons) SENr
Club Nutritionist Vegan Runners UK
PLANT-BASED 4 RUNNING

Quick and easy nutritionally balanced recipes and meal plans 4 active living.

Philip Woodbridge MSc BA (Hons) SENr

80 QUICK AND EASY RECIPES 4 PLANT-BASED TRAINING AND RUNNING

"Excellently researched and written, with all the key elements of nutritional information required for not just vegan runners, but for all vegan athletes"

Neil Robinson - Vegan Ex Professional Footballer

RRP £15

INCLUDES AN EVIDENCE BASED MYTH BUSTING PLANT-BASED NUTRITION GUIDE
References:


