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## Meal Replacement Programs

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## Talk Structure


- ☐ Meal replacement (MR) definitions and regulatory issues
- ☐ MR composition and support
- ☐ MR and weight loss – is there an advantage?
- ☐ MR vs structured diet
- ☐ MR- weight gain prevention
  
- ☐ MR- composition matters
  
- ☐ MR and diabetes
- ☐ MR in commercial programs
  
- ☐ Concluding remarks



## MR Definitions and Regulatory


- **formulated meal replacement** means a single food or pre-packaged selection of foods that is sold as a replacement for one or more of the daily meals but not as a total diet replacement.
- Formulated meal replacements must contain in a serving no less than –
  - (a) 12 g protein; and
  - (b) 850 kJ; and
  - (c) 25 % of the RDI of each of selected vitamins and minerals
- **Formulated meal replacements** not intended to be used as a total dietary replacement
- A **meal replacement program** uses a mixed diet of food and meal replacement. eg Celebrity Slim

FSANZ  
Food Standards Code 2.9.5



## VLED - Total Diet Replacements


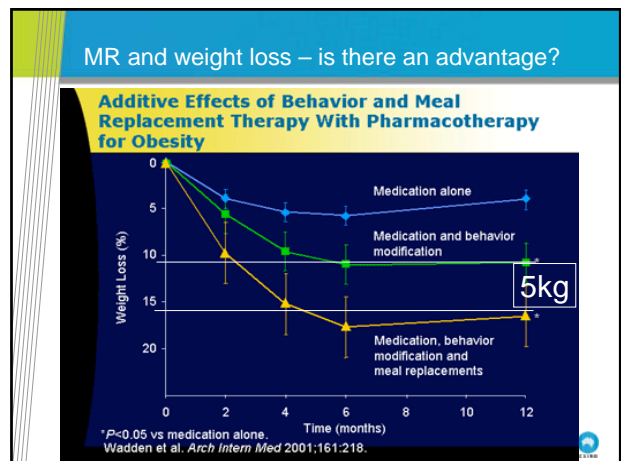
- Very Low Energy Diets (VLCD or VLED) typically provide between 1800–2500 kJ per day (eg OPTIFAST)
- VLED defined as **total** dietary replacement with meal replacements
- VLEDs are not yet regulated
- Very low calorie diets (VLEDs) (draft)
  - 1.7–3.3 MJ per day
  - Omega-3 and omega-6 fatty acids
  - 50 g carbohydrate per day
  - 50 g protein per day
- Minimum and maximum levels for 24 prescribed vitamin and minerals



## MR composition and support

	Type	KJ	Pro	Fat	Carb	Cost (\$)	Support
Optifast	VLED/MR	635	17.3	2.3	15.0	\$2.14-2.99	Website, online support program
Celebrity Slim	MR	870	18.4	2.4	27.4	\$2.85-2.95	Website
KicStart	VLED/MR	582	16.8	2.5	10.7	1.87	Website
Ultraslim	MR	875	12	2.6	32.6	1.15	Website
Optislim	VLED	627	17.4	0.8	17.7	2.38	Website, online support group
Tony Ferguson	MR	851	17.1	2.1	28.4	3.25	Website, online forum, pharmacy-based support
Xantrax	MR	557	21.1	1.5	7.8	2.85	Website
Kate Morgan	MR	872	17.2	2.2	29.3	2.54	Website, online support
Betty Baxter	MR	860	12.1	3.8	30.5	3.19	Website

Collins et al 2009

## MR and weight loss – is there an advantage?

**Weight management using a meal replacement strategy: meta and pooling analysis from six studies.** [Heymsfield et al 2003](#).

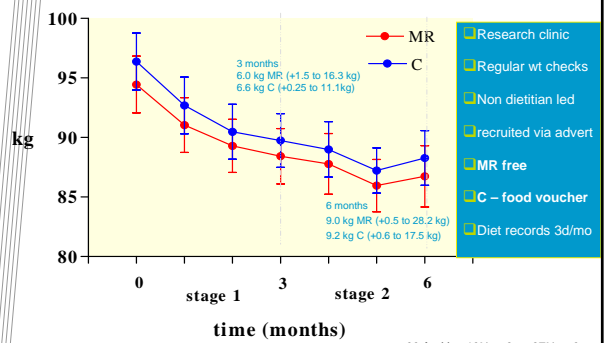
- PMR plan = low calorie (>800<or=1600 kcal/day) diet plus 1-2 meals replaced by MR product, and at least 1 meal regular foods.
- RCD – Isocaloric Regular foods diet
- Depending on the analysis and follow-up duration,
  - PMR group lost 7-8% body weight
  - RCD group lost 3-7% body weight.

**A random effects meta-analysis**  
**PMR at 3 mo 2.54 kg (P<0.01) greater weight loss**  
**PMR at 1 yr 2.43 kg (P=0.14) greater weight loss**

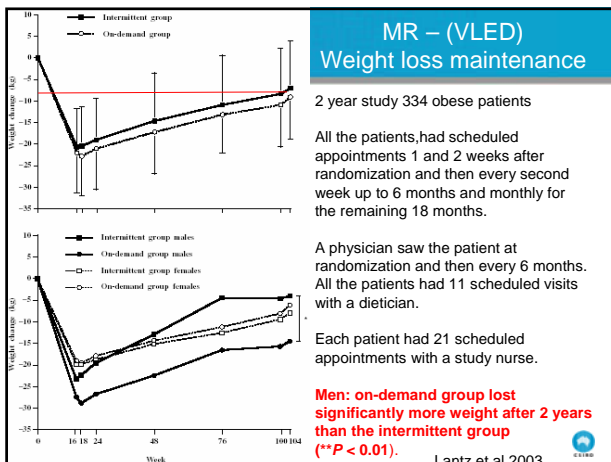
- The dropout rate for PMR and RCD groups was equivalent at 3 months and significantly less in the PMR group at 1 yr.
- No reported adverse events were attributable to either weight loss regimen.



## MR vs structured diet

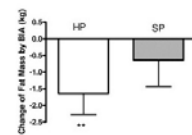


Noakes et al 2005

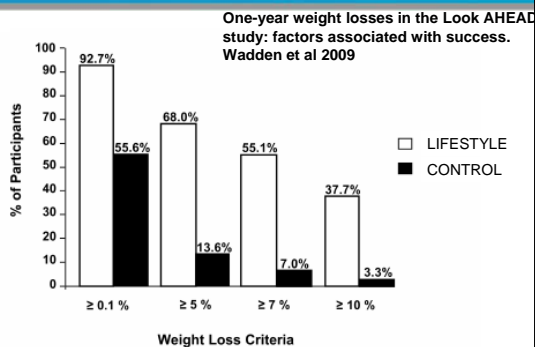


## MR – Effects of Composition

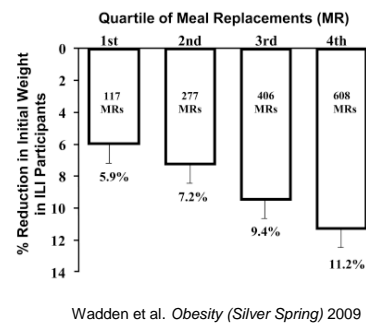
- Low GI – greater satiety [Ball et al 2003](#)
- Thickness of MR liquid; Solid vs liquid (bar vs shakes) – greater satiety and appetite regulatory hormone responses. [Mattes 2001](#) [Rothacker 2004](#), [Tieken et al 2007](#)
- Soy vs casein MR shakes RCT. No difference in weight loss at 3 months. [Anderson et al 2007](#)
- High carb vs high fat MR meal replacements for weight loss. Greater fat loss on low carb. [Wal et al](#)
- Fat Loss greater on MR High protein or High carbohydrate. (HP = -1.65 +/- 0.63 kg; SP = -0.64 +/- 0.79 kg, P = 0.05) [Treyzon et al 2008](#).



## Meal Replacements and Diabetes



## Meal Replacements and Diabetes



## Features of successful MR program

Both Diabetes Prevention Program and Look Ahead

- individual case managers or "lifestyle coaches;"
- frequent contact with participants;
- a structured, 16-session core-curriculum with behavioral self-management strategies
- supervised physical activity sessions;
- a more flexible maintenance intervention
- individualization through a "toolbox" of strategies;
- an extensive network of training, feedback, and clinical support.
- Provided meal replacement FREE



## WEIGHT MANAGEMENT CODE OF PRACTICE

### 23. PROVIDERS OF VERY LOW ENERGY DIET PRODUCTS

- 23.1 Members who are manufacturers of the Very low Energy Diet Products must provide evidence that the product is nutritionally adequate and clinically proven in the treatment of obesity.
- 23.2 The product must be accompanied by a treatment protocol that addresses the requirements of usage as well as guidelines for patient selection and care. The product must comply with Draft Standard 2.9.5.



## Efficacy of MR in Commercial Programs



## MR in Commercial Programs

Table. Baseline data and weight loss data for Healthy Solutions patients (who had a minimum recommended daily intake of five meal replacements and five servings of fruit or vegetables) and for Medically Supervised patients (who had a minimum recommended daily intake of five meal replacements)<sup>a,b</sup>

	Healthy Solutions		Medically Supervised	
	ITT	Completers	ITT	Completers
n	56	37	117	93
Age	47.9±1.8	47.8±2.1	48.3±1.1	48.8±1.2
Women (%)	63	68	68	67
Baseline BMI <sup>c</sup>	38.0±0.9	37.6±1.2	41.6±0.9	41.7±1.1 <sup>d</sup>
Initial weight (kg)	109.4±3.0	106.8±3.6	117.9±2.7	118.7±3.3
Weight loss (kg) <sup>e</sup>	12.8±1.3	17.0±1.4 <sup>f</sup>	16.8±1.0 <sup>f</sup>	19.2±1.8
Weight loss <sup>g</sup> (% initial weight)	11.7±1.1	15.8±1.1 <sup>f</sup>	13.9±0.7	16.4±0.7
Duration weight-loss treatment (wk)	12.7±1.2	17.6±1.2 <sup>f</sup>	18.2±1.0 <sup>f</sup>	19.1±1.0 <sup>f</sup>

<sup>a</sup>Significant differences are indicated. All values are mean ± standard error of mean.  
<sup>b</sup>The intention-to-treat (ITT) analyses used the last-observation-carried-forward method and the Completers analysis was for all patients who completed 9 weeks of core classes.  
<sup>c</sup>BMI = body mass index, calculated as kg/m<sup>2</sup>.  
<sup>d</sup>Value significantly different for corresponding Healthy Solutions value; P<0.05.  
<sup>e</sup>All weight losses were significantly different from baseline weight or no weight loss; P<0.001.  
<sup>f</sup>Value significantly different from ITT value; P<0.05.

Both options included

- weekly classes,
- daily records,
- midweek phone calls,
- minimum physical activity goal of 2,000 kcal/week

Furlow 2009



## Conclusion

- "many meal replacement products are available over the counter with minimal attention given to the health profile of the individual and little or no supervision or ongoing monitoring or opportunity to transition the person to a long-term healthy eating plan." Collins 2009

MR Strategy

- ..easy to administer and supervise;
- ..it is relatively cheap.
- ..questions remain about the long-term outcomes and safety of meal replacement products, their effects in comparison with other strategies, and their acceptability to patients. Eggar eMJA 2006



Need for more research on efficacy of commercial MR programs

