ENVIGO

Research Models and Services

Teklad Custom Diets

TD.88137 Adjusted calories diet (42% from fat)

A staple of atherosclerosis research

More than 25 years ago, our nutritionists collaborated with researchers at Rockefeller University to develop a diet with features of a 'Western Diet' to characterize and enhance atherosclerosis development in their newly generated *Apoe* deficient mouse model. With over 200 unique users worldwide, TD.88137 continues to be fed to genetically modified cardiovascular models to accelerate and enhance hypercholesterolemia and plaque formation.

Formula	g/Kg
Casein	195.0
DL-Methionine	3.0
Sucrose	341.46
Corn Starch	150.0
Andydrous Milkfat	210.0
Cholesterol	1.5
Cellulose	50.0
Mineral Mix, AIN-76 (170915)	35.0
Calcium Carbonate	4.0
Vitamin Mix, Teklad (40060)	10.0
Ethoxyquin	0.04

Selected nutrient information[1]

	% By weight	% kcal from
Protein	17.3	15.2
Carbohydrate	48.5	42.7
Fat	21.2	42.0
kcal/g	4.5	
Cholesterol[2]	0.2%	

[1] Values are calculated from ingredient analysis or manufacturer data.
[2] 0.15% added, 0.05% from fat source.

Teklad diets are designed and manufactured for research purposes only.

Critical dietary features of TD.88137 related to atherosclerosis development include:

+ Cholesterol (0.2% total cholesterol)
+ Total fat (21% by weight; 42% kcal from fat)
+ High in saturated fatty acids (>60% of total fatty acids)
+ High sucrose (34% by weight)

Typical fatty acid profile of TD.88137

Typical fatty acid analysis, % of diet[1]	Mean	SD
Total	20.7	1.5
Saturated fat	12.8	0.8
Monounsaturated fat	5.6	0.5
Polyunsaturated fat	1.0	0.2
Unknown[2]	1.3	0.3

Typical fatty acid profile, % of total fatty acids[1]	Mean	SD
Saturated fat	61.8	2.0
Monounsaturated fat	27.3	2.1
Polyunsaturated fat	4.7	0.8
4:0	2.1	1.1
6:0	1.5	0.7
8:0	1.1	0.3
10:0	2.6	0.5
12:0	3.3	0.5
14:0	10.6	0.9
16:0	28.9	1.3
16:1	1.5	0.2
18:0	12.5	0.8
18:1 (Oleic)	20.9	2.6
18:1 Isomers[3]	4.0	1.2
18:2 (Linoleic)	2.3	1.0
18:2 Isomers[4]	1.3	0.5
18:3 (Linolenic)	0.7	0.2

[1] n = 21, analysis conducted by two independent laboratories.
[2] Unidentified fatty acids and those contributing on average less than 0.5% of total fatty acids.
[3] Includes trans isomers elaidic and vaccenic acid and unidentified cis isomers.
[4] Includes trans isomers.

Key points from the literature

TD.88137 has been used to accelerate atherosclerosis development in *Apoe* and *Ldlr* deficient models:

+ In *Apoe* deficient mice, plasma cholesterol triples to >1500 mg/dL within three weeks (1, 2). Foam cell and lesion development occurs within 6-10 weeks (2-4). Fibrous plaque formation is observed at 15 weeks with the development of fibrous caps after 20 weeks (2).
+ *Ldlr* deficient mice fed for two weeks increase plasma cholesterol to >800 mg/dL and triglyceride to >300 mg/dL (5). After six weeks of feeding, hyperglycemia, hyperinsulinemia and dyslipidemia develop with small foam cell lesions in the aortic arch (6, 7).

For further information about TD.88137, or if you are interested in learning more about other atherogenic or high fat diets contact us at: **askanutritionist@envigo.com**

With over 420 citations, uses of TD.88137 continue to evolve and include atherosclerosis, obesity, non-alcoholic steatohepatitis (NASH), osteoporosis, hypertension and metabolic syndrome. Contact us for a more extensive reference list.

References

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2. **Nakashima, Y., *et al.,*** *Apoe*-deficient mice develop lesions of all phases of atherosclerosis throughout the arterial tree. *Arterioscler Thromb, 1994. 14(1): p. 133-40.*
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4. **Nakashima, Y., *et al.,*** Upregulation of VCAM-1 and ICAM-1 at atherosclerosis-prone sites on the endothelium in the *Apoe*-deficient mouse. *Arterioscler Thromb Vasc Biol, 1998. 18(5): p. 842-51.*
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6. **Tsuchiya, K., *et al.,*** FoxOs integrate pleiotropic actions of insulin in vascular endothelium to protect mice from atherosclerosis. *Cell Metab, 2012. 15(3): p. 372-81.*
7. **Huszar, D., *et al.,*** Increased LDL cholesterol and atherosclerosis in LDL receptor-deficient mice with attenuated expression of scavenger receptor B1. *Arterioscler Thromb Vasc Biol, 2000. 20(4): p. 1068-73.*
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9. **Schafer, K., *et al.,*** Leptin promotes vascular remodeling and neointimal growth in mice. *Arterioscler Thromb Vasc Biol, 2004. 24(1): p. 112-7.*
10. **Lijnen, H.R., *et al.,*** Nutritionally induced obesity is attenuated in transgenic mice overexpressing plasminogen activator inhibitor-1. *Arterioscler Thromb Vasc Biol, 2003. 23(1): p. 78-84.*
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12. **VanSaun MN, *et al.* 2009.** High fat diet induced hepatic steatosis establishes a permissive microenvironment for colorectal metastases and promotes primary dysplasia in a murine model. *Am J Pathol 175:355-64.*
13. **Dixon LJ, *et al.* 2013.** Caspase-1 as a central regulator of high fat diet-induced non-alcoholic steatohepatitis. *PLoS One 8:e56100.*

Control diet options for TD.88137

Natural ingredient diets

+ Also referred to as standard diets or chow
+ Diets differ in the source and level of nutrients as well as the presence of non-nutritive factors (such as phytates or phytoestrogens) compared to TD.88137
+ Limits inferences to differences in dietary pattern versus a specific dietary component

Ingredient matched, low fat diets

+ Controls for the type of ingredients, non-nutritive components and the source and level of specific nutrients
+ Suggested ingredient matched, low fat dietary controls for TD.88137 listed below; data sheets can be found on our website at envigo.com

Suggested ingredient matched, low fat controls

Diet	kcal/g	Fat, % by weight	% kcal from fat	Fat sources, % by weight	Sucrose, % by weight
TD.05230	3.7	5.2	12.6	3.7% milk fat, 1.3% soybean oil	34.1
TD.08485	3.6	5.2	13.0	3.7% milk fat, 1.3% soybean oil	12.0

Additional controls are available. Contact a nutritionist at askanutritionist@envigo.com.

Key planning information:

- Store diet refrigerated and plan to use within six months. Diet should be replaced at minimum once per week when fed on cage tops.
- Diets available as a soft ½" pellet or as a crumbly powder.
- Three kg minimum order quantity. For planning purposes, estimates for diet uses (including feed intake and diet waste) are 5 g of diet per mouse and 30 g of diet per rat per day.
- Two-day lead time for orders less than 10 kg. Two-week lead time for larger quantity orders.
- Lead time for irradiation adds two weeks for any quantity of diet and must be requested at the time you place your order. Changes in texture and browning may occur with irradiation.
- Shipping can affect pellet quality. Vacuum packaging can offer protection of the pellets during shipping. Two-day shipping is recommended during warmer months.
- Contact us to place an order, obtain pricing or check your order status.

Contact us

North America 800.483.5523 EU and Asia envigo.com/contactus teklad@envigo.com

Envigo RMS Division, 8520 Allison Pointe Blvd., Suite 400, Indianapolis, IN 46250, United States

envigo.com

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