**Supplementary file 3**. Articles that were not included and main reasons for exclusion:

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| **Nr** | **Authors** | **Article** | **Reason** |
| **1** | **Drummen 2020(1)** | High Compared with Moderate Protein Intake Reduces Adaptive Thermogenesis and Induces a Negative Energy Balance during Long-term Weight-Loss Maintenance in Participants with Prediabetes in the Postobese State: A PREVIEW Study | No weight loss / weight gain |
| **2** | **Shaw et al 2019(2)** | Effect of a Ketogenic Diet on Submaximal Exercise Capacity and Efficiency in Runners  | Sample size <10 |
| **3** | **Camps 2019(3)** | Association of FTO and ADRB2 gene variation with energy restriction T induced adaptations in resting energy expenditure and physical activity  | Other reason: Results already published in other paper (4) |
| **4** | **Langan-Evans 2019(5)** | Making weight safely: Assessment of within daily energy balance and manipulation of energy availability without symptoms of RED-S in an elite male Taekwondo athlete | article type |
| **5** | **Corley 2019(6)** | Changes in resting energy expenditure with intermittent fasting versus continuous daily restriction-a randomised controlled trial | article type |
| **6** | **Borges 2019(7)** | Adaptive thermogenesis and changes in body composition and physical fitness in army cadets | No weight loss / weight gain |
| **7** | **Beatty 2019(8)** | Examining changes in respiratory exchange ratio within an 8-week weight loss intervention | No weight loss / weight gain |
| **8** | **Thom, 2019(9)** | Adaptive thermogenesis, leptin and gut hormones during dietary induced weight loss: Impact on long-term weight loss maintenance | article type |
| **9** | **Ostendorf 2018(10)** | No consistent evidence of a disproportionately low resting energy expenditure in long-term successful weight-loss maintainers | Other reason: Participants had different periods for WL maintenance.  |
| **10** | **Redman 2018(11)** | Metabolic Slowing and Reduced Oxidative Damage with Sustained Caloric Restriction Support the Rate of Living and Oxidative Damage Theories of Aging | Unclear/inadequate methodology for AT |
| **11** | **Nymo 2018(12)** | Compensatory responses to weight loss and long-term relapse: Is there a link? | article type  |
| **12** | **Messias 2018(13)** | Individual adaptive thermogenesis and body composition changes after weight loss process | article type |
| **13** | **Hintze 2018(14)** | A one-year resistance training program following weight loss has no significant impact on body composition and energy expenditure in postmenopausal women living with overweight and obesity | Unclear/inadequate methodology for AT |
| **14** | **Heinitz 2018(15)** | Response of skeletal muscle UCP2-expression during metabolicadaptation to caloric restriction | Unclear/inadequate methodology for AT |
| **15** | **El Gohch 2018(16)** |  Weight cycling in adults with severe obesity: A longitudinal study. | No weight loss / weight gain |
| **16** | **Clamp 2018(17)** | Successful and unsuccessful weight-loss maintainers: strategies to counteract metabolic compensation following weight loss | Unclear/inadequate methodology for AT |
| **17** | **Byrne 2018(18)** | Changes in total and activity energy expenditure accompanying continuous versus intermittent energy restriction: the matador study. | article type |
| **18** | **Trexler 2018(19)** | Physiological Changes Following Competition in Maleand Female Physique Athletes: A Pilot Study | Unclear/inadequate methodology for AT |
| **19** | **Pardue 2017(20)** | Case Study: Unfavorable But Transient Physiological Changes During Contest Preparation in a Drug-Free Male Bodybuilder  | n<10 |
| **20** | **Nymo 2017(21)** |  Sustainability of changes in energy expenditure variables at 1 year follow-up after initial weight loss with a very-low energy diet | article type |
| **21** | **Koehler 2017(22)** | Less-than-expected weight loss in normal-weight women undergoing caloric restriction and exercise is accompanied by preservation of fat-free mass and metabolic adaptations | Unclear/inadequate methodology for AT |
| **22** | **Furber 2017(23)** | A 7-day high protein hypocaloric diet promotes cellular metabolic adaptations and attenuates lean mass loss in healthy males. | Unclear/inadequate methodology for AT |
| **23** | **Carnero 2017(24)** | Randomized Trial Reveals that Physical Activityand Energy Expenditure are Associated with Weightand Body Composition after RYGB | Unclear/inadequate methodology for AT |
| **24** | **Tam 2016(25)** | Energy metabolic adaptation and cardiometabolicimprovements one year after gastric bypass, sleeve gastrectomy and gastric band | Sample size <10;  |
| **25** | **Pontzer 2016(26)** | Constrained Total Energy Expenditure and Metabolic Adaptation to Physical Activity in Adult Humans. | No weight loss / weight gain |
| **26** | **Hall 2016(27)** | Energy expenditure and body composition changes after an isocaloric ketogenic diet in overweight and obese men. | Unclear/inadequate methodology for AT |
| **27** | **Triffoni-Melo 2016(28)** | Resting energy expenditure adaptationafter short-term caloric restriction inmorbidly obese women | Unclear/inadequate methodology for AT |
| **28** | **Siervo 2015(29)** | Imposed rate and extent of weight loss in obese men and adaptive changes in resting and total energy expenditure | Sample size <10 |
| **29** | **Jørgensen 2015(30)** | Timeline over which compensatory mechanisms are activated during weight loss with a very-low-calorie diet. | Article Type |
| **30** | **Jaime 2015(31)** | Effect of calorie restriction on energy expenditure in overweightand obese adult women | Unclear/inadequate methodology for AT |
| **31** | **Hume 2015(32)** | Compensations for Weight Loss in Successful and Unsuccessful Dieters. | Unclear/inadequate methodology for AT |
| **32** | **Herrmann 2015(33)** | Energy intake, nonexercise physical activity, and weight loss in responders and nonresponders: The Midwest Exercise Trial 2. | Unclear/inadequate methodology for AT |
| **33** | **Hasani 2015(34)** |  Effect of Laparoscopic Gastric Plication Surgery on Body Composition, Resting Energy Expenditure, Thyroid Hormones, and Physical Activity in Morbidly Obese Patients. | Unclear/inadequate methodology for AT |
| **34** | **Bakker 2015(35)** | Middle-aged overweight South Asian men exhibit a different metabolic adaptation to short-term energy restriction compared with Europeans. | Unclear/inadequate methodology for AT |
| **35** | **Knuth 2014(36)** | Metabolic Adaptation Following Massive WeightLoss is Related to the Degree of Energy Imbalance and Changes in Circulating Leptin | Other reason: Results already published in other paper (37) |
| **36** | **Coutinho 2014(38)** | The impact of speed of weight loss on body composition and compensatory mechanisms activated during weight reduction.  | Article type |
| **37** | **Werling 2013(39)** | Increased Postprandial Energy Expenditure May Explain Superior Long Term Weight Loss after Roux-en-Y Gastric Bypass Compared to Vertical Banded Gastroplasty. | Unclear/inadequate methodology for AT |
| **38** | **Tremblay 2013(40)** | Adaptive thermogenesis can make a difference in the ability of obese individuals to lose body weight. | Article type |
| **39** | **Byrne 2012(41)** | Does metabolic compensation explain the majority of less-than-expected weight loss in obese adults during a short-term severe diet and exercise intervention? | Unclear/inadequate methodology for AT |
| **40** | **Kissileff 2012 (42)** | Leptin reverses declines in satiation in weight-reduced obese humans | Sample size <10 |
| **41** | **Sumithran 2011 (43)** | Long-term persistence of hormonal adaptations to weight loss | Unclear/inadequate methodology for AT |
| **42** | **Lee TA 2010(44)** | Effects of dihydrocapsiate on adaptive anddiet-induced thermogenesis with a high proteinvery low calorie diet: a randomized control trial | Unclear/inadequate methodology for AT |
| **43** | **Johannsen 2010(45)** | A competitive weight loss program that includes intense daily physical activity results in extreme weight loss despite a large metabolic adaptation.  | Article type |
| **44** | **Galgani 2010(46)** | Leptin Replacement Prevents Weight Loss-Induced Metabolic Adaptation in Congenital Leptin-Deficient Patients | Sample size <10 |
| **45** | **Tremblay 2009 (47)** | Adaptive reduction in thermogenesis and resistance to lose fat in obese men. | Sample size <10; |
| **46** | **Fullmer 2009(48)** | The effect of calorie deficits of 25%, 40% and 55% on adaptation to resting energy expenditure and lean mass in healthy post-menopausal women.  | Article type  |
| **47** | **Rosenbaum 2008(49)** | Long-term persistence of adaptive thermogenesis in subjects whohave maintained a reduced body weight | Unclear/inadequate methodology for AT |
| **48** | **Martin 2007(50)** | Effect of Calorie Restriction on RestingMetabolic Rate and Spontaneous PhysicalActivity | Other reason: Results already published in other article (51) |
| **49** | **Abete 2008(52)** | Energy-restricted diets based on a distinct foodselection affecting the glycemic index inducedifferent weight loss and oxidative response | Unclear/inadequate methodology for AT |
| **50** | **Hall 2006(53)** | Computational model of in vivo human energy metabolism during semistarvation and refeeding. | Article type |
| **51** | **Heilbronn 2006(54)** | Effect of 6-month calorie restriction on biomarkers of longevity, metabolic adaptation, and oxidative stress in overweight individuals: a randomized controlled trial | Other reason – already published results |
| **52** | **Tremblay 2004(55)** | Thermogenesis and weight loss in obese individuals: a primary association with organochlorine pollution | Article type |
| **53** | **Doucet 2003(56)** | Greater than predicted decrease in energy expenditure during exercise after body weight loss in obese men | Unclear/inadequate methodology for AT  |
| **54** | **Hainer 2001(57)** | A twin study of weight loss and metabolic efficiency.  | Unclear/inadequate methodology for AT |
| **55** | **Weyer 2000(58)** | Energy Expenditure, Fat Oxidation, and Body WeightRegulation: A Study of Metabolic Adaptation to Long-Term Weight Change | No weight loss / weight gain |
| **56** | **Menozzi 2000(59)** | Resting metabolic rate, fat-free mass and catecholamine excretionduring weight loss in female obese patients | Unclear/inadequate methodology for AT |
| **57** | **Weyer 2000 (60)** | Energy metabolism after 2 y of energy restriction: the Biosphere 2 experiment. | Sample size N<10 |
| **58** | **Agus 2000(61)** | Dietary composition and physiologic adaptations to energy restriction. | Unclear/inadequate methodology for AT |
| **59** | **Weinsier 2000 (62)**  | Energy expenditure and free-living physical activity in black and white women: comparison and after weight loss | Unclear/inadequate methodology for AT |
| **60** | **Wadden 1996 (63)** | Effects of weight cycling on the resting energy expenditure and body composition of obese women.  | Unclear/inadequate methodology for AT |
| **61** | **Leibel 1995(64)** | Changes in energy expenditure resulting from altered body weight | Sample size <10 |
| **62** | [**Schultink 1993**](file:///g/Schultink%2C%20J.%20Werner)**(65)** | Seasonal weight-loss and metabolic adaptation in rural beninese women - the relationship with body-mass index. | No measurements of body composition stores Body composition - Skinfolds |
| **63** | **Luke 1992 (66)** | Basal metabolic rate, fat-free mass, and body cell mass during energy restriction. | Unclear/inadequate methodology for AT |
| **64** | **Manore 1991 (67)** | Energy expenditure at rest and during exercise in nonobese female cyclical dieters and in nondieting control subjects. | Unclear/inadequate methodology for AT |
| **65** | **Andersson 1991(68)** | The effects of exercise training on body composition and metabolism in men and women.  | Unclear/inadequate methodology for AT |
| **66** | **Melby 1991(69)** | Diet- induced weight loss and metabolic changes in obese women with high versus low prior weight loss/regain.  | No measurements of body composition stores |
| **67** | **Lemons 1989(70)** | Selection of appropriate exercise regimes for weight reduction during VLCD and maintenance. | Unclear/inadequate methodology for AT |
| **68** | **Garby 1988(71)** | Effect of 12 weeks' light-moderate underfeeding on 24-hour energy expenditure in normal male and female subjects | No measurements of body composition stores  |
| **69** | **Bessard 1983 (72)** | Energy expenditure and postprandial thermogenesis in obese women before and after weight loss. | Intervention < 1 week  |

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