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Professional Education Series

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Protein Deep Dive for Athletes, Active Individuals and the Aging Population

TODAY'S AGENDA:

- Welcome
- Speaker Introduction
- Presentation
- Q&A
- Closing

WEBINAR HOST:

Keith Hine, MS, RD
VP of Healthcare, Sports & Professional Education
Orgain, LLC

WEBINAR PRESENTER:

Kelly Jones, MS, RD, CSSD, LDN
Board Certified Specialist in Sports Dietetics Owner, Kelly Jones Nutrition, LLC

Protein Deep Dive

for athletes, active individuals and the aging population

Kelly Jones
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Disclosures

- I personally follow a plant-forward eating pattern.

- I have, or in the past 2 years have had an affiliation or financial interest with:
  - Orgain
  - NOW Sports
  - Wonderful Pistachios
  - Lifeway Foods
  - SNI Global

OBJECTIVES

- Utilize research on increased protein needs as you make broad recommendations for your clients and patients. (*CDR PI*: 8.1.1 + 8.1.5)

- Discuss the importance of protein intake timing as well as balanced with other macronutrients for muscle maintenance, satiety, and blood sugar control. (*CDR PI*: 8.1.5 + 8.3.8)

- Provide practical examples, considerate of individual barriers, to support clients and patients as they work to alter protein intake and timing. (*CDR PI*: 8.1.1)

Protein Recommendations

- RDA: 0.8 g/kg (.45 g/lb)
  a. AMDR: 10 - 35% of calories

- Endurance athletes: 1.2 -1.4 g/kg
- Strength athletes: 1.6 - 1.7 g/kg

- Who else needs more?

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When to recommend

Increased Protein

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INCREASED PROTEIN FOR *active adults*

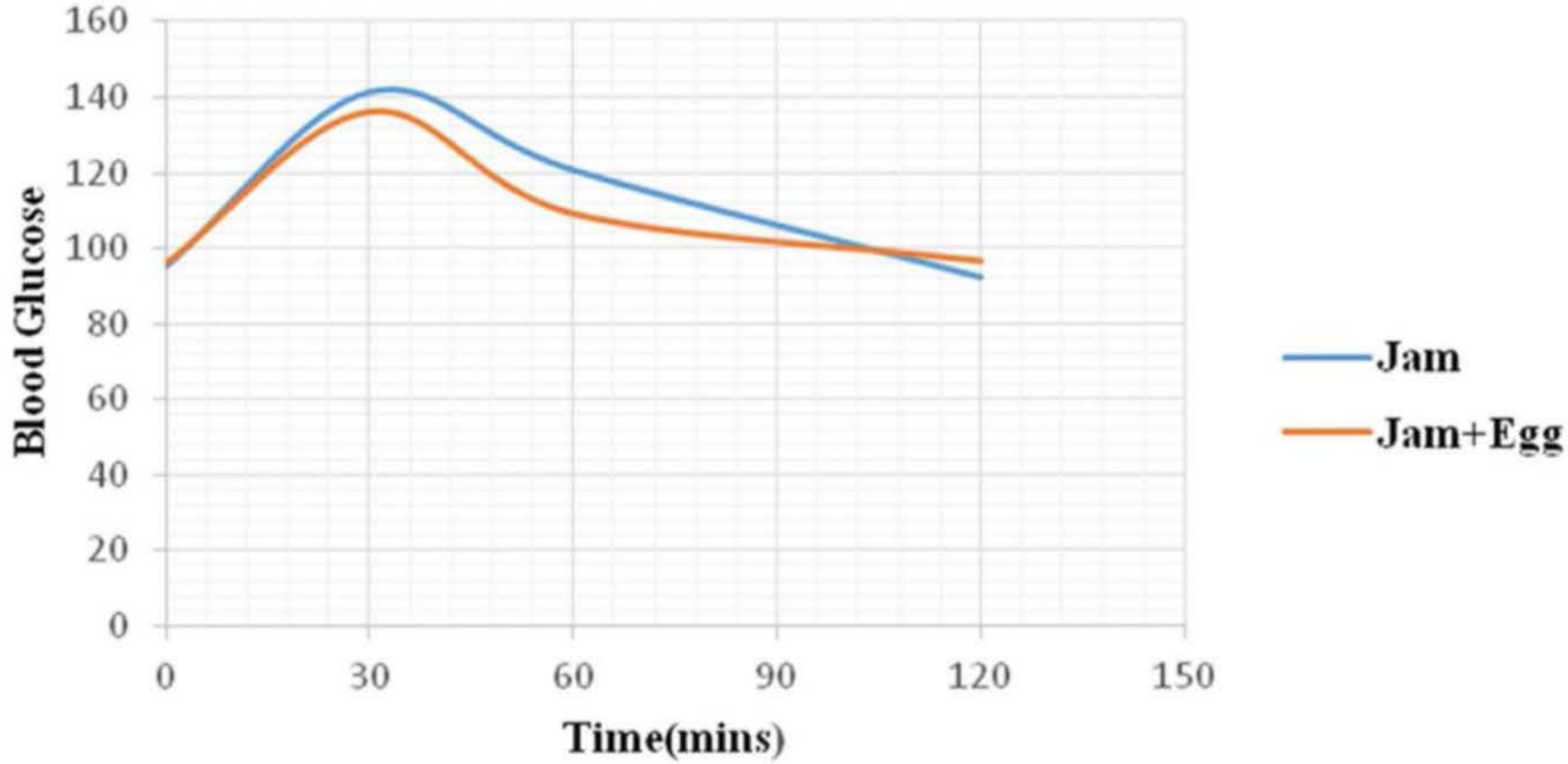
- RDA = 0.8 g/kg
- Gap between general recs and athlete needs
- 1.2-1.6 g/kg may better support optimal health outcomes
  - especially those who have high activity levels

Phillips SM, Chevalier S, Leidy HJ. Protein "requirements" beyond the RDA: implications for optimizing health. Appl Physiol Nutr Metab. 2016 May;41(5):565-72.

INCREASED PROTEIN FOR *adults with diabetes*

- Protein aids satiety and blood glucose responses
  - Increased protein may benefit insulin response
- Some studies: 1.5-2 g/kg is best for blood sugar control
- Macronutrient order may also benefit blood sugar responses

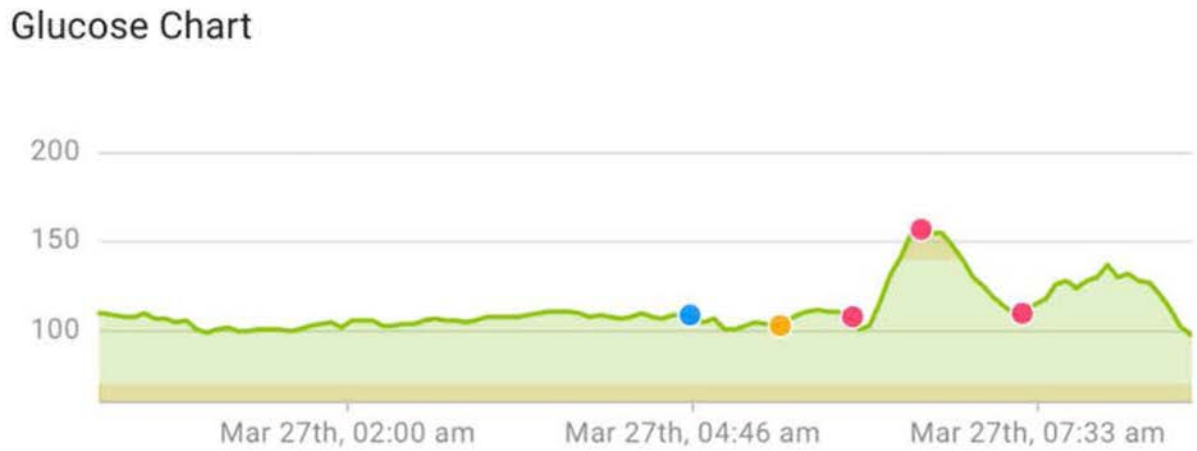
Pairing protein with carbohydrates enhances blood sugar response



Basturk B, Koc Ozerson Z, Yuksel A. Evaluation of the Effect of Macronutrients Combination on Blood Sugar Levels in Healthy Individuals. Iran J Public Health. 2021 Feb;50(2):280-287.

Client example: 33 YO athlete with prediabetes

Chocolate chip cookie = 159



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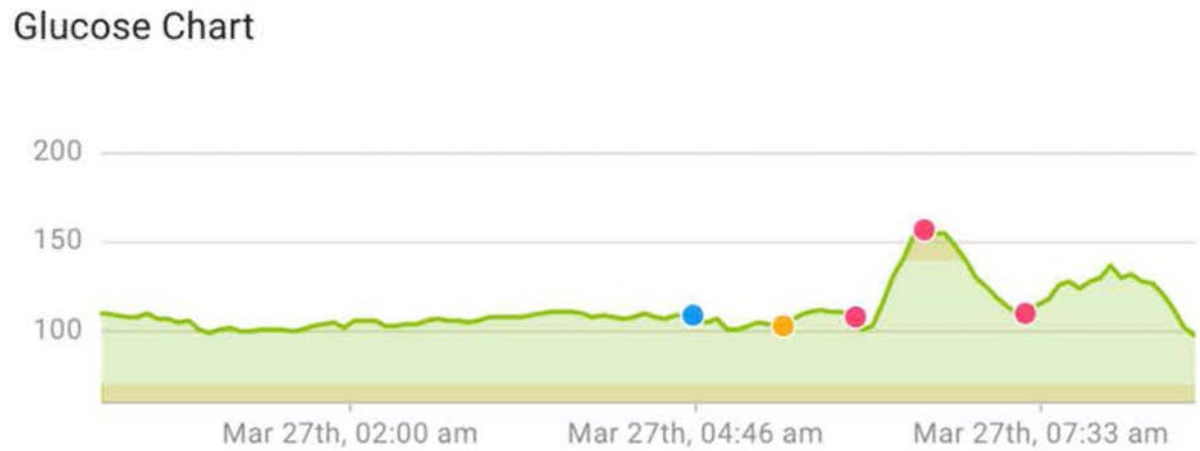
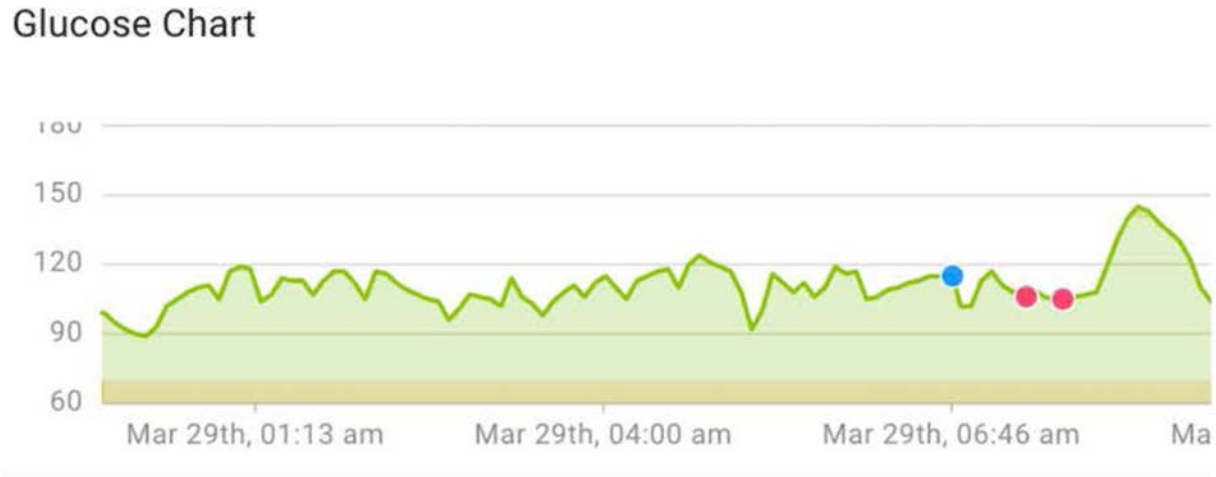


Eggs with fruit and chocolate chip cookie = 145



INCREASED PROTEIN FOR *women at varied life stages*

- Exclusive breastfeeding
  - DRI = 1.05g/kg
  - IOM recommends 1.3 g/kg
  - Study: <1.5g/kg = negative nitrogen balance
  - Small 2020 study suggests *1.7-1.9 g/kg*

- Perimenopause and menopause
  - Hormonal factors impact nutrient metabolism; cause muscle loss, fat gain
  - 1-1.2 g/kg minimum to benefit body composition

INCREASED PROTEIN FOR *the aging population*

- RDA for 65+ = 0.8 g/kg

- 1-1.3 g/kg may = 40% less loss of muscle mass and function
- 1.2 - 1.5 g/kg may be best for those with chronic illness
- Up to 2 g/kg suggested to optimize functionality

- Higher intakes associated with *higher* bone mineral density

WEIGHT AND BODY COMP *considerations*

- Higher protein may improve weight/comp, *without* planned energy restriction
- More protein at breakfast = satiety, reduce cravings
- Increased TEF and LBM may increase energy expenditure
- Fat loss and muscle gain *can* occur simultaneously
- 30g at each meal?
  - Aim for 0.25 - 0.4 g/kg 4x/day

Protein *Timing*

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timed protein intake for muscle

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- 0.25 g/kg, 4-5x/day optimizes MPS
- Skipping breakfast?
  - may limit exercise performance
  - can decrease ability to meet protein needs
- Pre-exercise protein may benefit MPS
- Evening protein doses enhance MPS without fat gain

timed protein for older adults and diabetes

- Per meal recommendations exist
- Up to 0.4 g/kg or 30 g may *increase* muscle mass and strength
- More protein at breakfast and lunch vs. lunch and dinner = increased muscle mass and function
- More protein at all meals and snacks benefits blood sugar management and appetite

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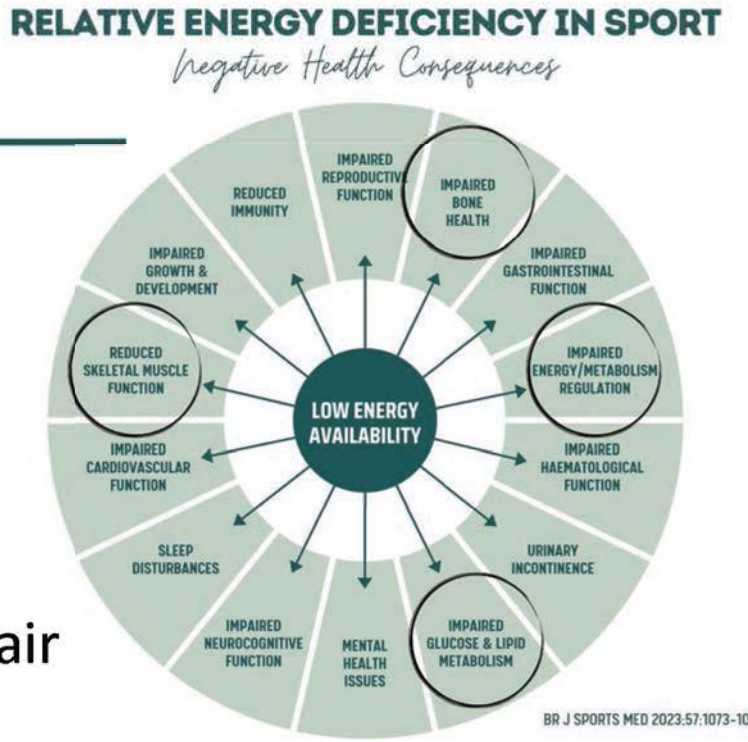
ADEQUATE ENERGY



Communicate long term risk of restrictive diets

- Extreme deficits will result in conversion of protein into energy
  a. This may harm muscle mass, immune function and more
- Low energy availability compromises both muscle and bone repair
  - Understand REDS when working with the active population
- Acknowledge lack of long term data on weight loss medications
  a. Ensure individualized approach, with RD as often as possible
- 2-2.5g/kg protein preserves muscle with reasonable calorie restriction

Protein

Quality

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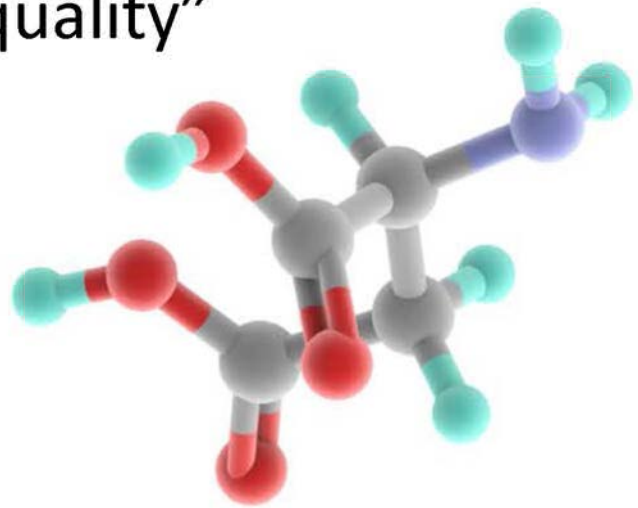
ESSENTIAL / INDISPENSABLE AMINO ACIDS

- More essential amino acids (EAA)= higher protein “quality”
- Most plants are limited in certain EAAs
- “Complete” proteins: Animal + Soy
- High Quality Plant Examples:
  - Pea, quinoa, hemp, pistachio
  - Chia seeds, buckwheat, spirulina



PDCAAS AND DIAAS

Food	PDCAAS	DIAAS	Limiting Amino Acids
Soy protein isolate	0.98	0.90	Met + Cys
Pea protein isolate	0.89	0.82	Met + Cys
Rice protein concentrate	0.42	0.37	Lys
Cooked Peas	0.60	0.58	Met + Cys
Cooked Rice	0.62	0.59	Lys
Almonds	0.39	0.40	Lys
Chickpeas	0.74	0.83	Met + Cys
Tofu	0.56	0.52	Met + Cys
Whole Milk	1.00	1.14	Met + Cys

Assessment of single food source protein quality

- Based on digestibility and assumed absorption/use

Protein Digestibility Corrected Amino Acid Scores (PDCAAS)

- Older, still more widely referenced method
- Considers digestibility and use based on feces sample

Digestible Indispensable Amino Acid Scores (DIAAS)

- Amino acid samples from ileum may increase accuracy
- Data still incomplete; many regulatory considerations

Ingredients:
ORGAIN ORGANIC PROTEIN BLEND™
(ORGANIC PEA PROTEIN, ORGANIC BROWN RICE PROTEIN, ORGANIC CHIA SEED),

WE EAT MEALS, NOT SINGLE FOODS

PDCAAS and DIAAS provide information on single foods

- Mixed plant meals can provide different protein quality

- Should not *need* complementary proteins at meals "so long as a variety of proteins are consumed and energy needs are met"
    - *But could pairing proteins be beneficial*?
    - *Examples*:
        - *Legumes + grains | Nuts + grains | Seeds + Legumes*

TRIGGERING MUSCLE PROTEIN SYNTHESIS

- **Leucine** has been identified as
  the trigger for muscle protein synthesis (MPS)
- MPS may occur longer with enough leucine
  - with adequate total protein, calories, EAAs
- 20–40 g of protein with 1–3 g of leucine
- Proteins with the greatest leucine content:
  dairy, meats + poultry, egg, and soy products.

pairing plant protein foods to meet EAA and leucine targets

- Oats made with soymilk, topped with pumpkin seeds
- Whole wheat pasta with lentil “meat” sauce
- Buckwheat soba stir fry with tofu or edamame
- Quinoa veggie bowl with adzuki beans and peas
- Smoothie with high quality plant protein

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Popular Supplements

help or hype?

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What is worth the hype?

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Creatine

- Associated with muscle mass enhancements
- May reduce muscle breakdown and functional loss
- May also support bone remodeling and brain health
- 3-5g/day

HMB

- a leucine metabolite
- 3g/day may have anti-catabolic effect on muscle mass
- May be best for those immobilized post-injury/surgery, or with sarcopenia

BCAAs

- Adequate Branched Chain Amino Acids should be obtained from foods
- Leucine likely the most important to consider for non-endurance athletes

Science

into practice

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Protein goals

- Determine realistic protein goals for your clients and patients
  - Consider age, gender, activity level, genetics
  - Consider total dose and distribution
  - Start small with one meal or snack per day
- Start with motivational interviewing and education on breakfast and snacks
- Provide examples of high quality plant protein foods and leucine sources

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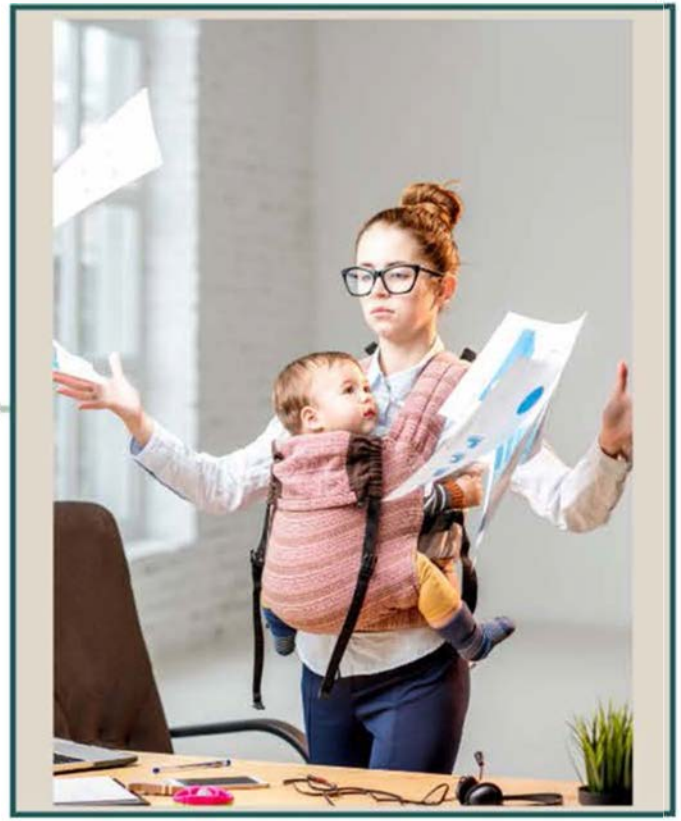
CONSIDERATIONS FOR *the elite athlete*

- High energy needs
  - post exercise appetite suppression
  - satiety factor
- Injury or surgery
- Travel and erratic schedules
  - consider diet, health and fitness history

CONSIDERATIONS FOR *the active professional*

- Busy schedules
- Family responsibilities
- High stress and inconsistent sleep
- Trendy diet temptations

CONSIDERATIONS FOR *postpartum*



A support system is *critical*

- Poor sleep and hormone shifts impact appetite
- Priority on kids vs. self reduces adult food prep
- Lack of alone time increases stress
- Need quick, convenient, practical options; no fancy diets or food shaming

CONSIDERATIONS FOR *older adults*

Encourage change early and often

- Barriers to good nutrition with age:
  - Grocery trip frequency
  - Food preparation
  - Appetite
  - Mental health

Building high protein meals and snacks *in real life*

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Easy breakfast combos:

- High protein cereal with milk or soymilk, nuts, berries
- Veggie egg muffins with whole grain toast
- Protein waffles, PB, dried fruit
- Microwave oats + protein powder + frozen fruit
- Oats made
- Drinkable high protein yogurt + apple
- Protein smoothie made with fruit, avocado, milk
- Veggie scramble and pre-prepped baby potatoes

Easy high protein snacks

- Hard boiled eggs, low fat cheese, carrots + hummus
- Mixed roasted fava beans, pistachios + raisins
- Edamame and fruit
- Roasted edamame, dried fruit + dark chocolate chips
- Ready to drink protein shake
- Guacamole with whole grain crackers + turkey roll ups
- Cottage cheese with pineapple
- Greek yogurt with high protein granola and fruit

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