

Worksheet Freebie Packet for the RD/RDN Exam

PASS THE EXAM PREP

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Use these worksheets as you study for the RD/RDN Exam.

Disease Topic Sheet Template

The disease topic sheet template includes an introductory page that describes the purpose of each 'section' in the template. At the top, write the disease, and then fill in each section (Prevalence, Incidence, Etiology, Pathophysiology, Diagnosis, Signs and Symptoms, Complications, Treatment, Nutrition Problems, Nutrition Interventions) as applicable to that disease state. Print off the topic sheet template as many times as you need.

Domain III + IV Formulas and Concepts

This document contains formulas and concepts for Food Service, Financial Management, and Marketing. These formulas correspond to the Calculations and Formulas study guide and the Management Concepts study guide from the Study Smarter Method.

NCP Worksheets

Review what the Nutrition Care Process is, what is done during each step, and as you review the definitions and key points of each of the 4 NCP steps, contrast how that process is applied to individuals or groups receiving Nutrition Education versus Medical Nutrition Therapy. The best place to find out about the Nutrition Care Process is your dietetic coursework materials and the Academy. You can access a free tutorial from eNCPT here: <https://www.ncpro.org/404.cfm?fnf=/encpt-tutorials>

Digestion Worksheet

Use this worksheet as you study the digestive process. It breaks down digestion into the 3 macronutrients (carbohydrate, lipid, and fat), into the types of digestion (mechanical and chemical), and locations in the GI tract (mouth, stomach, small intestine, and colon). You should know what form a macronutrient is in when it enters a location, what effect mechanical digestion has on it and what effect chemical digestion has on it (specifically the enzymes). Additional information such as the interplay of digestive enzymes and hormones in the secretion of pancreatic juice, bile, etc. are also important for you to know.

GI Tract Worksheet

Use this worksheet as you study the digestive process. It breaks down the GI tract into sections, and has space for you to indicate what GI hormones are produced or act in a location, what nutrients are digested there and by what enzymes, and what nutrients are absorbed. This worksheet builds on the Digestion Worksheet, requiring you to consider your knowledge of the hormones and absorption.

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Lab Values Worksheet

You should be able to fill out every cell for every lab value. The headers prompt you to consider multiple aspects of what you need to know – normal limits, low and high limits, and what low or high means. When you think through what low or high means, you'll be thinking about what we are actually measuring (serum levels relative to fluid volume, not tissue levels) and any modifications those proteins or substances undergo in our body as a result of metabolic processes.

For **normal limits**, research and find the typical normal limits for adults. If it varies for men and women, include that. Think about why it would vary by sex.

For **marker of?**, think about what that lab value is a marker of. Why do we bother sending off that lab test? What is it telling us? This section is especially important for values like albumin versus prealbumin, and thinking through the next 2 sections will help you elaborate on that.

For **low?** And **high?** Think about what a low or high value is telling you. Does it indicate dehydration? Fluid overload? Malnutrition? Reduced kidney function?

For **notes and exceptions**, include anything that comes up while you're researching the lab values that doesn't fit under another header. You can also include examples here.

Vitamins and Minerals Worksheet

You won't fill out every cell for every vitamin or mineral, but the headers will prompt you to consider multiple aspects of how we consume, digest, absorb, and use different vitamins and minerals (V/M) and the implications for nutrition care.

For **properties**, consider: does the V/M inhibit the absorption of other nutrients? Is it absorbed easier when combined with other nutrients? What are the implications for a nutrition care plan? [Example: vitamin C and iron; dairy and iron]

For **function and metabolism**, consider: What does the V/M do in our body once in the blood stream? What organs does it go to? To absorb it, does our body need to make any modifications (example: folate). Is the type of V/M or specific structure of it different depending on the source (example: heme and non-heme iron, folate and folic acid) and does that affect how we absorb it? Do we typically check blood levels of that V/M? If so, what are normal limits? What does it mean if its high or low?

For **sources**, consider the different forms of V/M and dietary sources, supplements, etc. If you noted in the previous section that there are different structures, name that structure and add here (example: dietary – folate, supp – folic acid).

For **deficiencies**, describe any named syndromes (example: Beri beri) and the associated symptoms and treatment.

On the next page is a blank template for a disease state topic sheet. At the top, write the disease, and then fill in each section as applicable.

Prevalence and Incidence

How common is the disease in the US? Are there important risk factors for it? Are there different types of the disease?

Etiology and Pathophysiology

What causes or contributes to the disease? How does the disease process occur? What goes wrong in the body? What are the implications?

Diagnosis

How is the disease diagnosed? Are there imaging procedures, elevated biomarkers, or biopsies?

Signs and Symptoms

What signs and symptoms would you expect to see in the medical record before you go see the patient? What signs would you see upon a physical examination, or when you ask them about their symptoms?

Complications

What complications or events can occur with this disease? What are the nutrition implications of those complications?

Treatment

What medical or surgical treatments are common with the disease? Are there medications, like diuretics, that have nutrition implications?

Nutrition Problems

What nutrition problems might you see in this disease state? Do they have trouble with low appetite or early satiety? Are they at increased risk of micronutrient deficiencies?

Nutrition Interventions

What would you recommend to address the nutrition problems? For example, if a cancer patient is dealing with dry mouth, what would you recommend? Or if they have a metal taste with food, would you recommend they switch to plastic utensils?

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Prevalence and Incidence
Diagnosis
Complications
Nutrition Problems

Etiology and Pathophysiology
Signs and Symptoms
Treatment
Nutrition Interventions

All the formulas and concepts in this document are explained in-depth in the Study Smarter Method Calculations & Formulas Study Guide and the Food Service Logistics Study Guide.

Food Cost Percentage is a general term that may be applied in different ways (such as below with daily and monthly percentages). When not thinking about time but rather a specific unit you're selling, we are interested in the ratio of the food cost (cost to make the item) and what we are selling it for.

$$\text{Food Cost Percentage} = \frac{\text{Food Cost}}{\text{Selling Price}}$$

Daily Food Cost Percentage answers the question "How good was your menu today?"

$$\text{Daily Food Cost Percentage} = \frac{\text{Daily Food Cost}}{\text{Daily Sales}}$$

Food Cost is calculated using the opening inventory (for example, 1st of this month) and closing inventory (last of the month, or 1st of the next month), and the cost of food purchases over that time. For the example above (daily food cost) we would use the beginning and end of the day.

$$\text{Food Cost} = \text{Opening Inventory} + \text{Purchases} - \text{Closing Inventory}$$

Monthly Cost Percentage is calculated to look at your spending on food versus your income from sales.

$$\text{Monthly Food Cost Percentage} = \frac{\text{Monthly food cost}}{\text{Monthly Sales}}$$

Food Cost Per Meal can be calculated using the total food cost over a period of time and the number of meals served during the period of time.

$$\text{Cost per meal} = \frac{\text{Total food cost}}{\text{Number of meals}}$$

Cost-of-goods sold (COGS) are the expenses that go into products sold. COGS include purchasing, labor, food costs, etc.

$$\text{Cost of goods sold} = \text{Opening Inventory} + (\text{Purchases} + \text{Labor}) - \text{Closing Inventory}$$

Popularity is assessed by the number of units sold and isn't tied into profit.

$$\text{Popularity index} = \frac{\text{units sold}}{\text{total units sold}}$$

Profitability can be calculated several ways, and the formula you use will depend on what you're given in the question.

$$\begin{aligned} \text{Unit Price Profit} \\ = \text{Selling Price} - \text{Food Cost} \end{aligned}$$

$$\text{Profit} = \text{item profit} \times \text{units sold}$$

Percent Profit Contribution

$$\text{Percent Profit Contribution} = \frac{\text{Unit item profit}}{\text{Total profit}} = \frac{\text{Selling Price} - \text{Food Cost}}{\text{Total profit}}$$

Selling Price

Selling price can be calculated in several ways, but the main idea is, "How much will you sell this item for, given how much it costs to make it?" and/or, "How much will you sell this item for, given how much profit you want to generate?"

$$\text{Selling Price} = \frac{\text{Cost to make per unit}}{\text{Food Cost (decimal)}}$$

Factor Pricing Method (Mark-Up Pricing Method)

Markup factors can be calculated in several ways but will either incorporate both food cost and labor cost, or food cost alone.

$$\text{Selling Price} = \text{Markup Factor} \times \text{Raw Food Cost}$$

$$\text{Markup Factor} = \frac{1}{\text{Food Cost}}$$

$$\text{Markup Factor} = \frac{1}{\text{Food Cost} + \text{Labor Cost}}$$

Prime Cost Pricing Method

$$\text{Selling Price} = \text{Markup Factor} \times \text{Prime Cost}$$

$$\text{Markup Factor} = \frac{1}{\text{Food Cost} + \text{Labor Cost}}$$

$$\text{Prime Cost} = \text{Raw Food Cost} + \text{Labor Cost}$$

Breakeven Point

Break-even point is when expenses and revenue are equal (total costs = total revenue). It's used to determine the number of sales or overall profits that will cover total costs. Total cost includes both fixed costs and variable costs. Fixed costs are the same over a time period and aren't relevant to output decisions. Variable costs vary with output and typically increase at a constant rate relative to labor costs and capital.

$$\text{Formula 1: } \frac{\text{Fixed costs}}{\left(1 - \left(\frac{\text{Variable costs}}{\text{Sales}}\right)\right)} \quad \text{Formula 2: } \frac{\text{Fixed Costs}}{(\text{Sales price per unit}) - (\text{Variable cost per unit})}$$

Contribution Margin is the difference between the sales price of a unit and the variable cost of a unit.

$$\text{Contribution margin} = \text{Sales price per unit} - \text{Variable cost per unit}$$

Depreciation is calculated when making large purchases, such as a new convection oven. The cost of purchasing that asset is allocated over the span of the usable life and depreciation is an expense that you account for financially.

$$\text{Yearly depreciation} = \frac{\text{Cost of Equipment} - \text{Salvage value}}{\text{Years of Usable Life}}$$

Scoop Size refers to standard scoop sizes (numbers) with a standard volume. They are important for standardized recipes and portioning.

$$\text{Scoop Volume} = \frac{32}{\text{scoop size}} \qquad \text{Scoop Size} = \frac{32}{\text{scoop volume}}$$

Full-Time Equivalents (FTEs)

$$1 \text{ FTE} = \frac{40 \text{ hours}}{\text{week} *}$$

$$1 \text{ FTE} = \frac{8 \text{ hours}}{\text{day}}$$

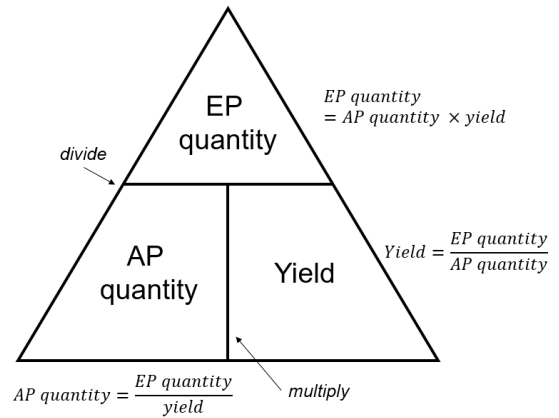
*assuming 5 day work week

Meals per labor hour questions may require you to convert FTEs to hours or minutes worked (meals per labor minute), or vice versa (meals per FTE).

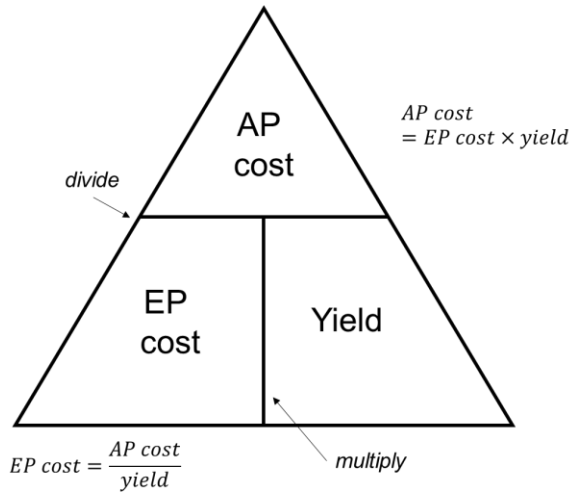
$$\text{Meals per labor} < \text{unit of time} > = \frac{\# \text{ Meals Produced}}{\# \text{ Hours Worked (or minutes)}}$$

As purchased quantity is the amount (weight, volume, or count) of the product as we purchased it or received from a vendor. It is also the “amount to buy” that you might back-calculate if you have the EP quantity needed for a recipe.

Edible portion quantity is the amount (weight, volume, or count) of the product after we have prepared it.



As purchased cost is the amount paid for the as purchased amount. **As purchased cost per unit** is the total AP cost divided by the quantity purchased (AP quantity).



Edible portion cost is the cost to the department of the portion served. The EP cost takes into account the trim and waste that we calculated in the previous section with yield.

$$\text{Shrinkage} = \frac{\text{Raw weight} \times \% \text{ lost} \times \frac{16\text{oz}}{1\text{lb}}}{\text{serving size (oz)}}$$

Economic Order Quantity (EOQ) is used when thinking about inventory par stock and reorder points. The EOQ is the optimum quantity of an item to be purchased each time you place an order in order to minimize the cost of ordering, shipping, and carrying an item in inventory.

$$EOQ = \sqrt{\frac{2FS}{CP}}$$

F = fixed ordering cost
S = sales per year (annual demand)
C = inventory cost as percent of total cost
P = purchase price per unit

Inventory Turnover Rate

How often is inventory replenished or consumed? A high inventory turnover rate (< 1 week) points to stealing or pilfering, or that the cooking staff aren't using standardized recipes. A low inventory turnover rate (> 2 weeks) points to too much money being tied up in stock and an increased risk of product spoiling on the shelves.

$$\text{Inventory turnover rate} = \frac{\text{Food Cost}}{\text{Average Inventory Cost}}$$

Fixed Order Quantity & Re-order points

In contrast to par stock ordering, which will bring an item stock number up to par level every time you place an order, using fixed order quantity and re-order points accounts for lead and delivery time and tells you at what point in time you should reorder before reaching your safety stock number.

$$\text{Re - order point} = \text{Safety Stock} + \text{Average Sales} \times \text{Lead Time}$$

Profit Margin is the portion of sales after paying expenses.

$$\text{Profit Margin} = \frac{\text{Net Profit}}{\text{Sales}} = \frac{\text{Sales} - \text{Total Expenses}}{\text{Sales}}$$

Net Profit is the difference between sales and total expenses.

$$\text{Net Profit} = \text{Sales} - \text{Total Expenses}$$

Gross Profit is a profitability measure that shows how efficient a company manages its labor and supplies in production. It can be calculated several ways.

$$\text{Gross Profit} = \text{Revenue} - \text{COGS}$$

$$\text{Gross Profit} = \text{Sales} - \text{Cost of Sales}$$

Use these worksheets to note the key features of the Nutrition Care Process. You can access the eNCPT online tutorial for free here: <https://www.ncpro.org/404.cfm?fnc=/encpt-tutorials>

THE NUTRITION CARE PROCESS	
	Notes
Why was it developed?	
Who uses it?	
Key features	
Other notes	

Use these worksheets to note the purpose of each NCP step, and what is performed during each step. You can access the eNCPT online tutorial for free here: <https://www.ncpro.org/404.cfm?fnc=/encpt-tutorials>

NCP Step	Purpose	Steps
Assessment and Reassessment		
Diagnosis		
Intervention		
Monitoring and Evaluation		

Review what the Nutrition Care Process is, and as you review the definitions and key points of each of the 4 NCP steps, contrast how that process is applied to individuals receiving Nutrition Education versus Medical Nutrition Therapy. Access the eNCPT online tutorial for free here:

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NCP FOR INDIVIDUALS		
NCP Step	Nutrition Education	MNT
Assessment and Reassessment		
Diagnosis		
Intervention		
Monitoring and Evaluation		

Review what the Nutrition Care Process is, and as you review the definitions and key points of each of the 4 NCP steps, contrast how that process is applied to individuals receiving Nutrition Education versus Medical Nutrition Therapy. Access the eNCPT online tutorial for free here:

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NCP FOR GROUPS		
NCP Step	Nutrition Education	MNT
Assessment and Reassessment		
Diagnosis		
Intervention		
Monitoring and Evaluation		

Use this worksheet as you study the digestive process. It breaks down digestion into the 3 macronutrients (carbohydrate, lipid, and fat), into the types of digestion (mechanical and chemical), and locations in the GI tract (mouth, stomach, small intestine, and colon). You should know what form a macronutrient is in when it enters a location, what effect mechanical digestion has on it and what effect chemical digestion has on it (specifically the enzymes). Additional information such as the interplay of digestive enzymes and hormones in the secretion of pancreatic juice, bile, etc. are also important for you to know.

Location	Digestion	Carbohydrate	Protein	Lipids
Mouth	Mechanical			
	Chemical			
Stomach	Mechanical			
	Chemical			
Small Intestine	Mechanical			
	Chemical			
Colon	Mechanical			
	Chemical			

Use this worksheet as you study the digestive process. It breaks down the GI tract into sections, and has space for you to indicate what GI hormones are produced or act in a location, what nutrients are digested there and by what enzymes, and what nutrients are absorbed. This worksheet builds on the Digestion Worksheet, requiring you to consider your knowledge of the hormones and absorption.

Location	Hormones	Digestion	Absorption
Mouth			
Stomach			
Small Intestine			
<i>Duodenum</i>			
<i>Jejunum</i>			
<i>Ileum</i>			
Colon			

Lab Value	Normal Limits	Marker of?	Low?	High?	Notes and Exceptions
Albumin					
Prealbumin / Transthyretin					
CRP					
Transferrin					
Ferritin					

Lab Value	Normal Limits	Marker of?	Low?	High?	Notes and Exceptions
Hematocrit					
Hemoglobin					
MCV					
MCHC					
Serum glucose					

Lab Value	Normal Limits	Marker of?	Low?	High?	Notes and Exceptions
HOMA-IR					
Hemoglobin A1C					
Serum creatinine					
Uric acid					
BUN					

Lab Value	Normal Limits	Marker of?	Low?	High?	Notes and Exceptions
eGFR					
Sodium					
Prothrombin time					
Total Cholesterol					
LDL-Cholesterol					

Lab Value	Normal Limits	Marker of?	Low?	High?	Notes and Exceptions
HDL-Cholesterol					
Triglycerides					
Calcium					
Phosphorus					
Potassium					

Lab Value	Normal Limits	Marker of?	Low?	High?	Notes and Exceptions
Chloride					
pH					
Bicarbonate					

Lab Value	Normal Limits	Marker of?	Low?	High?	Notes and Exceptions

	Properties	Function and Metabolism	Sources	Deficiencies
Chromium				
Sodium				
Potassium				
Sulfur				
Choline				

	Properties	Function and Metabolism	Sources	Deficiencies
Zinc				
Iodine				
Fluorine				
Copper				
Selenium				

	Properties	Function and Metabolism	Sources	Deficiencies
Manganese				
Niacin				
Folate				
Vitamin B6 Pyridoxine				
Vitamin B12				

	Properties	Function and Metabolism	Sources	Deficiencies
Pantothenic Acid				
Ascorbic acid				
Biotin				
Myo-Inositol				
Calcium				

	Properties	Function and Metabolism	Sources	Deficiencies
Phosphorus				
Iron				
Magnesium				
Vitamin A				
Vitamin D				

	Properties	Function and Metabolism	Sources	Deficiencies
Vitamin E				
Vitamin K				
Vitamin B1 Thiamin				
Vitamin B2 Riboflavin				