Lectures Note

COST ACCOUNTING

Chapter 9. Joint Product and By-Product

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Chapter IX

Joint Product and By-Product

After studying this chapter, you should be able to:

1. ***Explain the difference between joint and by-product***
2. ***Determine the method of cost allocations for joint product***
3. ***Explain the method for accounting of by-product***
4. ***Prepare cost of production report of each method***
5. ***Journalize the transactions needed***

Study objectives of this chapter will give you the explanation joint product concepts and allocations the cost including cost of by-product

A. Joint Products

Also called main product, result from those manufacturing operations in which companies simultaneously produce two or more products of significant sales value

B. By-Products

By-products are merely incidental products resulting from the processing of other products.

Distinction between joint products and by-products depends largely on the market value of the products.

a. Joint products are produced in larger quantities.
b. Joint products have larger market values and make a more meaningful contribution to revenue.

C. Joint Cost

1. Joint costs are costs incurred to simultaneously process two or more products of significant market value.
2. Joint production costs should properly be allocated to joint products and by- products.

Exhibit 9.1 Life cycle by product

D. <u>Spilt-off Point and Separable Cost</u>

→ Also called the point of separation. Split-off point is the point in which the joint products can be separated from by-products

Cost of each joint product = allocation of joint cost + separable production costs

Separable production costs are material, labor and overhead used in the later processing of the distinguishable products.

Exhibit 9.2 Split off point and separable cost

E. <u>Accounting for By-Products</u>

Two method of accounting for by-products are:

1. **Net Market Value (Net Realizable Value) Assigned to By-Product Inventory**

Net Market Value (NMV) = Selling Price – Separable Costs

Joint Product Costs = Joint products*Total Production Cost - NMV

a. The entry to separate the by products is:

By-Product Inventory	*xxx*	
WIP Inventory		*xxx*

b. The entry to record the sales of by-products is:

Cash/Account Receivables	*xxx*	
By-Products Inventory		*xxx*

If the market value of by-product is **large enough**, assigning NMV to the by-products inventory is preferable.

2. **Net Market Value Treated as Other Income**

a. A memo entry to record only the physical amount of by-products

b. When by-products are sold, the entire NMV is recorded as other income:

Cash/Account Receivables	*xxx*	
Other Income		*xxx*

If the market value of by-product is **so small**, recording the NMV as other income is preferable. The justification is the firm's intention is to produce main products, not by-products.

Illustration

	Joint Products	**By-Products**
Production	50,000 units	20,000 units
Sales	48,000 units	19,000 units
Ending Inventory	?	?
Sales Value units	$10 per units	$1.10 per

No beginning finished goods inventory

Separable costs of by products:	per unit
Materials	$0.030
Labor	0.020
Factory Overhead Applied	0.010
Marketing Costs Applied	0.015
Administrative Costs Applied	0.025
Total Separable Costs	$0.100

Joint production cost for Joint Product and By-Products:

Material	$ 50,000
Labor	150,000
Factory Overhead	100,000
	$ 300,000
Administration and Marketing Expense	40,000

Required:

1. Compare the calculation of Income before Tax by Using Method 1 (NMV assigned to By-Products Inventory) and Method 2 (NMV treated as Other Income)
2. Prepare the journal entries needed.

Solutions:

NMV of By-Products = Selling Price – Separable Cost

= $ 1.10 - $ 0.100

= $ 1.00

	Method 1 NMV Assigned to By-Product Inventory	Method 2 NMV Treated as Other Income
Sales (joint product)	**$ 480,000**	**$ 480,000**
Cost of Good Sold:		
Beginning Inventory	**-**	**-**
Joint Production Costs	**$ 300,000**	**$ 300,000**
Less: NMV of by-products	*20.000**$1* **(20,000)**	**-**
Net Production Cost	**$ 280,000**	**$ 300,000**
Goods Available for Sale	**$ 280,000**	**$ 300,000**
Ending Inventory	**11,200**	**12,000**
	(*280.000/50.000*2.000*)	(*300.000/50.000*2.000*)
COGS	**$ 268,800**	**$ 288,000**
Gross Profit	**$ 211,200**	**$ 192,000**
Adm. And Marketing Expenses	**40,000**	**40,000**
Operating Income	**$ 171,200**	**$ 152,000**
Other Income: Revenue of By-Products	**-**	*19.000*$1* **19,000**
Income Before Taxes	**$ 171,200**	**$ 171,000**

Journal Entries for By-Products (Method 1)

1. To record the by-product inventory

By-Product Inventory	*20,000*		
WIP Inventory	*20,000*		

2. To record the separable production costs

By-Product Inventory	*1,200*		
Material Cost		*600*	(0.03*20.000)
Labor Cost		*400*	(0.02*20.000)
Factory Overhead		*200*	(1,200-600-400)

3. To record the application of Marketing and Administration

By-Product Inventory	*800*		
Marketing Expense Control		*300*	(0.015*20.000)
Administration Expense Control		*400*	(0.025*20.000)

4. To record the sales of by-product

Cash (19.000*$1.1)	*20,900*	
By-Product Inventory		*20,900*

5. If the by-products are sold for $1.25 instead of the $1.10, the entry is:

Cash (19.000*$1.25)	*23,750*	
By-Product Inventory		*20,900*
Gain on Sale of By-Product Inventory		*2,850*

Journal Entries for Sales of By-Product Inventory (Method 2)

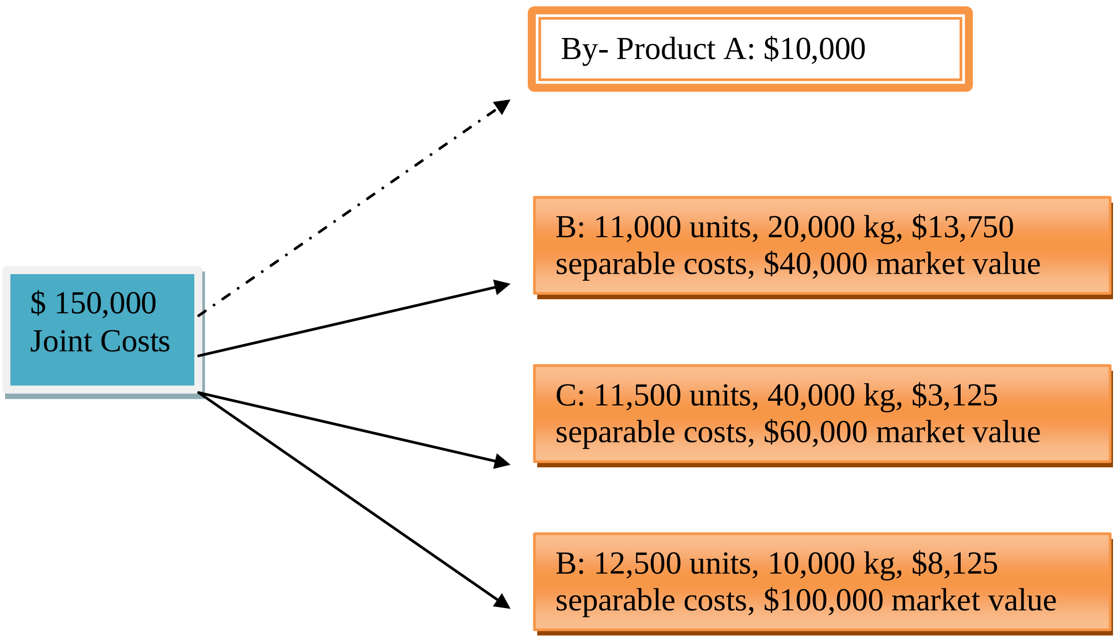
Cash (19.000*$1.25)	*19,000*	
Other Income		*19,000*

F. <u>Assignment of Costs to Joint Products</u>

1. Physical Measures:
   a. Quantity Method
   b. Average Unit Cost Method
   c. Weighted Factor Method

2. Market or Sales Value:
   a. Gross Market Value Method
   b. Net (realizable) Market Value Method or Sales Value at the split-off method

<u>Illustration</u>



Answers:

Quantity Method			
Joint Products	Kg	Distribution of Net Cost of Production	
B	20,000	20,000 / 70,000 x $140,000	= $ 40,000
C	40,000	40,000 / 70,000 x $140,000	= $ 80,000
D	10,000	10,000 / 70,000 x $140,000	= $ 20,000
Total	70,000		$ 140,000

Average Unit Cost Method			
Joint Products	Unit	Distribution of Net Cost of Production	
B	11,000	11,000 / 35,000 x $140,000	= $ 44,000
C	11,500	11,500 / 35,000 x $140,000	= $ 46,000
D	12,500	12,500 / 35,000 x $140,000	= $ 50,000
Total	35,000		$ 140,000

Weighted Factor Method				
Joint Products	Unit	Points/ Units	Weighted Units	Distribution of Net Cost of Production
B	11,000	10	110,000	110,000/280,000 x $140,000= $ 55,000
C	11,500	5	57,500	57,500/280,000 x $140,000 = $ 28,750
D	12,500	9	112,500	112,500/280,000 x $140,000= $ 56,250
Total	35,000		280,000	$ 140,000

Gross Market Value Method				
Joint Products	No. of Unit	MV/ units	Gross MV	Distribution of Net Cost of Production
B	40,000	$ 1	40,000	40,000/200,000 x $140,000 = $ 28,000
C	30,000	2	60,000	60,000/200,000 x $140,000 = $ 42,000
D	25,000	4	100,000	100,000/200,000 x $140,000= $ 70,000
Total	35,000		200,000	$ 140,000

Net Market (Realizable) Value Method				
Joint Products	Gross MV	Separable Cost	Net MV	Distribution of Net Cost of Production
B	40,000	13,750	26,250	26,250/175,000 x $140,000 = $ 21,000
C	60,000	3,125	56,875	56,875/175,000 x $140,000 = $ 45,500
D	100,000	8,125	91,875	91,875/175,000 x $140,000= $ 73,500
Total	200,000	25,000	175,000	$ 140,000

Journal entry to record the allocations of joint product costs (using net market value) are:

Product B Inventory	*21,000*	
Product C Inventory	*45,500*	
Product D Inventory	*73,500*	
WIP Inventory		*140,000*

Quiz 25 minutes

The Joe Scot Palm manufactures 3 products: CPO (Crude palm oil), Palm Meat, and Fiber. CPO and Palm Meat are the main products while the Fiber is the by-product. Costs to produce these products consist of raw material of $50 millions and conversation costs of $100 millions. The plant produces 20,000 liters of CPO, 2,000 kg of Palm Meat, and 500 kg of Fiber. The selling price of CPO is $15,000 per liter, Palm Meat $10,000 per kg, and Fiber $5,000 per kg. To sell Fiber is required the marketing and administrative expenses of $100 per kg.

Required:

Calculate the costs if main products and by product using net market value method and make the entries needed.

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