

MRP

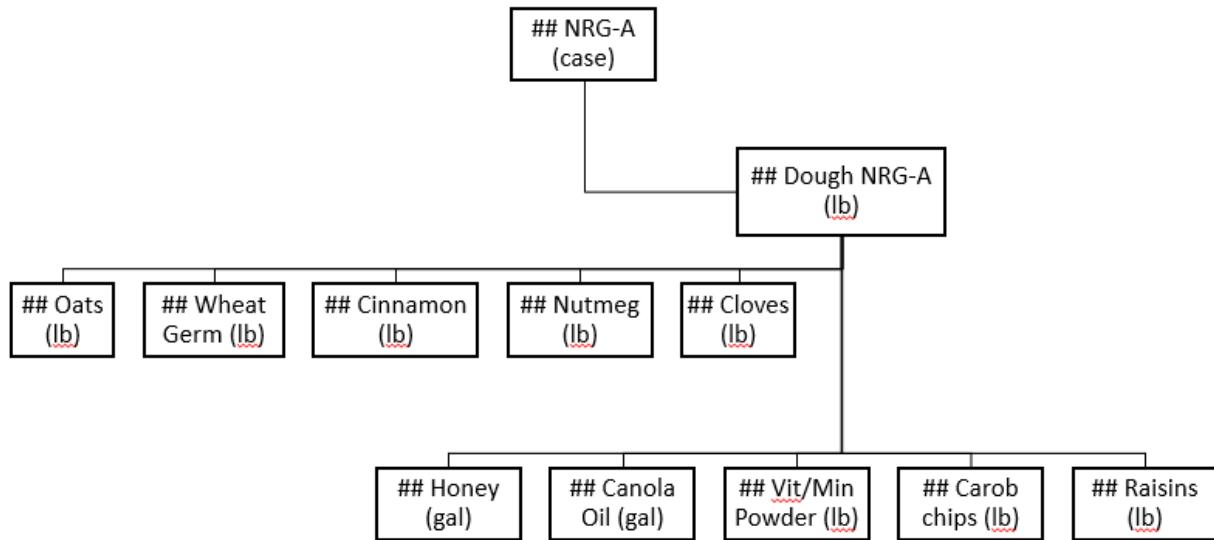
Exercise Introduction

Material resource planning is intended for 3 objectives:

- Ensure materials are available for production and products are available for delivery to customers.
- Maintain the lowest possible material and product levels in store to achieve LEAN processes.
- Plan manufacturing activities, delivery schedules and purchasing activities.

Bill of Material (BOM)

A critical input to the MRP process is the bill of material (BOM), which shows how components and semi-finished products are combined to produce the final product. A graphical representation of the BOM for the NRG-A bar is shown below:

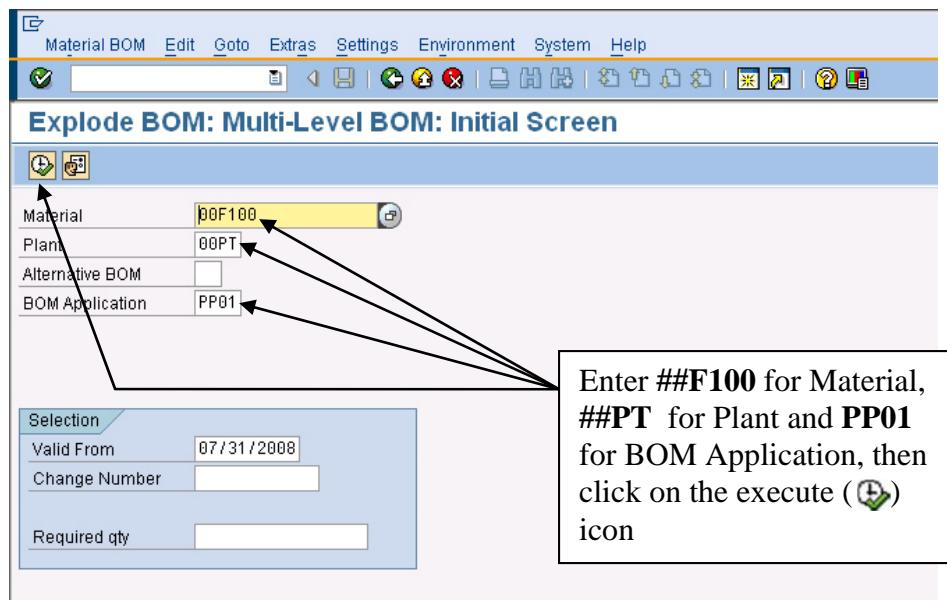


The raw materials (Oats, Wheat Germ, etc.) are combined in a mixer to produce a 500 lb. batch of dough. The dough is then transferred to the baking line, where it is formed into bars, baked and packaged. For simplicity, we have ignored the wrappers, boxes and cases that are needed to produce a complete case of Fitter Snacker bars.

To view the BOMs for Fitter Snacker, follow the menu path:

**Logistics ▷ Production ▷ Master Data ▷ Bills of Material ▷ Reporting ▷ BOM
Explosion ▷ Material BOM ▷ Multilevel BOM**

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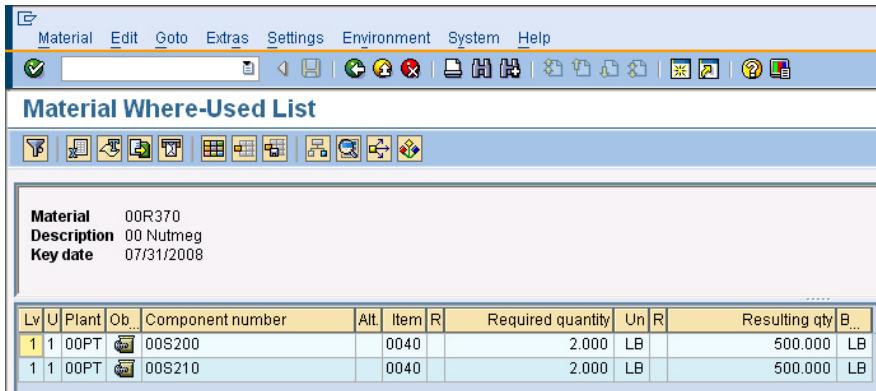
Display Multilevel BOM																																																																																										
Material 00F100 Plant/Usage/Alt. 00PT/1/01 Description 00 NRG-A Base Qty (CS) 7.000 Reqd Qty (CS) 7																																																																																										
<table border="1"> <thead> <tr> <th>Level no.</th><th>Item</th><th>Obj.</th><th>Component</th><th> </th><th> </th><th> </th></tr> </thead> <tbody> <tr> <td>.1</td><td>0010</td><td>00S200</td><td></td><td></td><td></td><td></td></tr> <tr> <td>..2</td><td>0010</td><td>00R380</td><td></td><td></td><td></td><td></td></tr> <tr> <td>..2</td><td>0020</td><td>00R420</td><td>00 Wheat Germ</td><td></td><td>50</td><td>LB</td></tr> <tr> <td>..2</td><td>0030</td><td>00R320</td><td>00 Cinnamon</td><td></td><td>5</td><td>LB</td></tr> <tr> <td>..2</td><td>0040</td><td>00R370</td><td>00 Nutmeg</td><td></td><td>2</td><td>LB</td></tr> <tr> <td>..2</td><td>0050</td><td>00R330</td><td>00 Cloves</td><td></td><td>1</td><td>LB</td></tr> <tr> <td>..2</td><td>0060</td><td>00R360</td><td>00 Honey</td><td></td><td>10</td><td>GAL</td></tr> <tr> <td>..2</td><td>0070</td><td>00R300</td><td>00 Canola</td><td></td><td>7</td><td>GAL</td></tr> <tr> <td>..2</td><td>0080</td><td>00R410</td><td>00 VitMin Powder</td><td></td><td>5</td><td>LB</td></tr> <tr> <td>..2</td><td>0090</td><td>00R310</td><td>00 Carob Chips</td><td></td><td>50</td><td>LB</td></tr> <tr> <td>..2</td><td>0100</td><td>00R400</td><td>00 Raisins</td><td></td><td>50</td><td>LB</td></tr> </tbody> </table>							Level no.	Item	Obj.	Component				.1	0010	00S200					..2	0010	00R380					..2	0020	00R420	00 Wheat Germ		50	LB	..2	0030	00R320	00 Cinnamon		5	LB	..2	0040	00R370	00 Nutmeg		2	LB	..2	0050	00R330	00 Cloves		1	LB	..2	0060	00R360	00 Honey		10	GAL	..2	0070	00R300	00 Canola		7	GAL	..2	0080	00R410	00 VitMin Powder		5	LB	..2	0090	00R310	00 Carob Chips		50	LB	..2	0100	00R400	00 Raisins		50	LB
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..2	0100	00R400	00 Raisins		50	LB																																																																																				

This screen shows 7 cases of snack bars requires 500 lbs. of dough, and that to produce 500 lbs. of dough, 300 lbs. of Oats, 50 lbs. of Wheat Germ, etc. are required

This screen shows the recipe required for seven cases of dough. To learn more about any of the materials required to make an NRG-A bar, select the item and click on the detail icon.

With the nutmeg selected, click on the where-used icon (Where-Used icon), which will call up the following screen:

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This screen shows that Nutmeg is used in two products—the dough for NRG-A and NRG-B bars. (You can double click on each line to view the products.) According to help.sap.com, the where-used list can be used to:

- Determine requirements for a specific material
- Select products that are affected by a change to an individual part
- Find assemblies that will be delayed if, for example, there is a delay in the delivery of a raw material
- Calculate the effect on the cost of a product if the price of a raw material rises

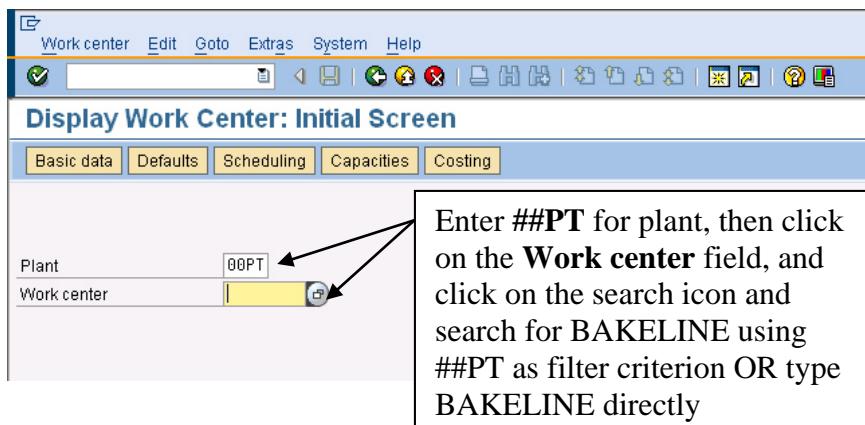
Click on the exit icon (🏠) until you return to the SAP Easy Access screen.

Display Workcenters

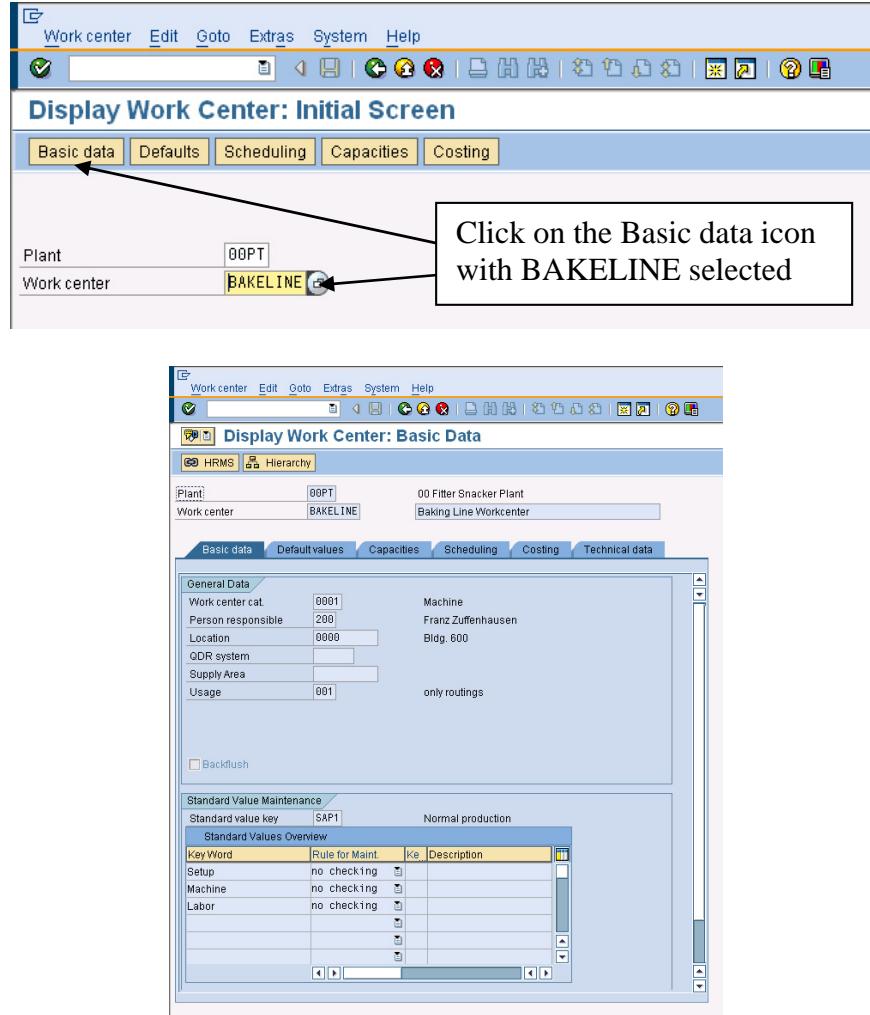
Production is carried out at workcenters. In the SAP ERP system, workcenters can represent machines or groups of machines, production lines, assembly lines, employees or groups of employees.

To display the workcenters used for Fitter Snacker's snack bar production, follow the menu path:

Logistics > Production > Master Data > Work Centers > Work Center > Display



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This multi-tabbed screen contains all relevant data for the workcenter.
Click on the exit icon () until you return to the SAP Easy Access screen.

Routings

Routings define the work centers that a product must visit in the production process. Routings also define the operations that must be performed at each workcenter and the components that are needed for each operation.

1. Create ##F100 (NRG-A bar) and ##F110 (NRG-B bar) Routings

To create a routing for the NRG-A bars, follow the menu path:

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Logistics > Production > Master Data > Routings > Routings > Standard Routings
 > Create

Create Routing: Initial Screen

Material: 00F100
 Plant: 00PT
 Sales Document: [] Sales Document Item: []
 WBS Element: []
 Group: 00GROUP
 Validity:
 Change Number: []
 Key date: 08/01/2008
 Revision Level: []
 Additional data:
 Profile: []

Enter ##F100 for material, ##PT for plant and ##Group for Group, then click on the enter icon

Create Routing: Header Details

Material 00F100 00 NRG-A
 Task list:
 Group: 006GROUP
 Group Counter: 1 00 NRG-A
 Plant: 00PT
 Production line:
 Line hierarchy: []
 General data:
 Usage: 1
 Status: 4
 Planner group: []
 Planning work center: []
 CAPP order: []
 From Lot Size: []
 Old task list no.: []

Enter 1 for Usage and 4 for Status, then click on the Operations icon

Create Routing: Operation Overview

Material 00F100 00 NRG-A
 Sequence: 0
 Work center: BAKELINE 00PT BAKE
 Description: Bake Dough
 Operation Overview:

Op.	SOp	Work ce	Plnt	Co.	Standard	Description	Lo	P...	Cl...	O...	Pe...	C...	Su...	Base Quant...	U...	StdValueTxt1	UnitActivity	UnitActivity
0010		BAKELINE	00PT	BAKE		Bake Dough								7	CS			
0020			00PT											1	CS			
0030			00PT											1	CS			

Enter BAKELINE for Work center
 Enter BAKE for Control key
 Enter Bake Dough for Description
 Enter 7 for Base Quantity
 Then click on the enter icon

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Operation Overview:

Op.	SOp	Work ce	Pint.	Co.	Standard	Description	Loc.	Ct.	O.	Pe.	C.	Su.	Base Quantity	U.	Setup	Unit	Activity	Machine	Unit	Activity
0010	BAKELINE	DOPT	BAKE			Bake Dough							7	CS	30	MIN	20			
0020		DOPT											1							
0030		DOPT											1							
0040																				
0050																				
0060																				
0070																				

Scroll over to extreme right and enter **30** for Setup and **30** for Machine, then click on the CompAlloc (component allocation) icon

Material Component Overview:

Material	Group	Sequence	Component	Quantity	Sort String	U.	It.	B.	Oper.	Seq.	C.	M.
00F100	00GROUP	0	0010 00S200	500							00	

Select the only component listed and then click on the New assignment icon

New Assignment:

Assign to
Oper./Act. [] Sequence []

Click on Oper./Act. (operation/activity) list

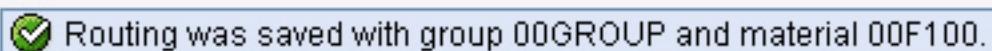
Choose Operation:

Seq. OpAc Work ctr Operation short text

0 0010 BAKELINE Bake Dough

Click on the enter icon

Click on the save icon () to save the routing. You will get a message like the following:



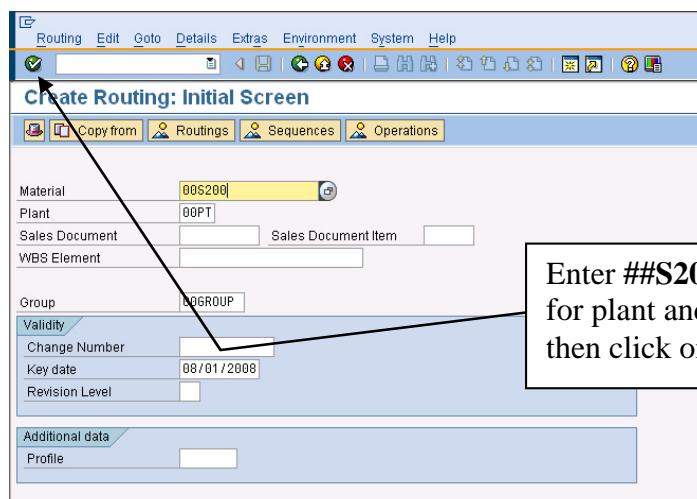
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Return to the beginning of section 1 and repeat the process to create a routing for material **##F110** (NRG-B bars). All entries are the same as for the **##F100** (NRG-A bars).

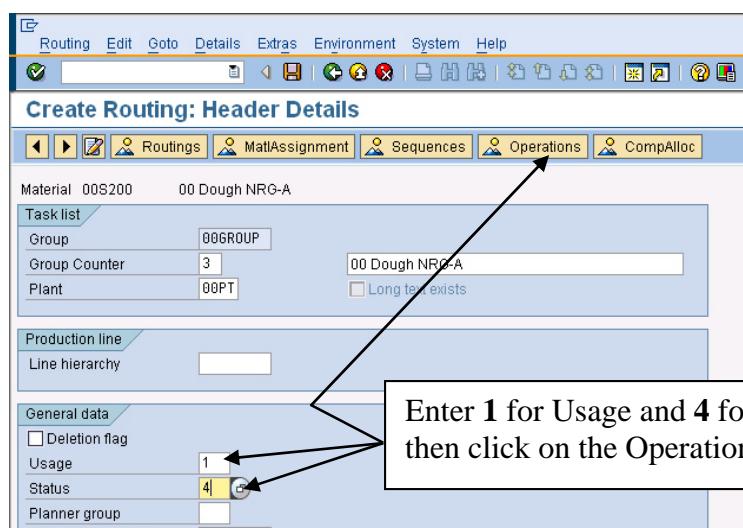
2. Create Routings for material **##S200** (dough for NRG-A bars) and **##S210** (dough for NRG-B bars)

To create a routing for **##S200** (dough for NRG-A bars), again follow the menu path:

Logistics > Production > Master Data > Routings > Routings > Standard Routings > Create



Enter **##S200** for material, **##PT** for plant and **##Group** for Group, then click on the enter icon



Enter **1** for Usage and **4** for Status, then click on the Operations icon

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Create Routing: Operation Overview

Material 00S2 Sequence 0

Enter the information shown, then click on the enter icon (✓)

Op.	SOp	Workcenter	Plnt	Do.	Standard	Description	Lo.	P.	Cl.	O.	Pe.	C.	Su.	Base Quantity	U.	StdVa
0010		MIXERS	0OPT	MIX		Mix Dough								500	LB	
0020			0OPT											1	LB	
0030			0APT											1	IR	

Create Routing: Operation Overview

Material 00S200 Sequence 0

00 Dough NRG-A Grp.Count3

Scroll over to the right and enter 30 for Setup and 30 for Machine, then click on CompAlloc

Op.	SOp	Lo.	P.	Cl.	O.	Pe.	C.	Su.	Base Quantity	Setup	Unit	Activity	Machine	Unit	Activity	Labor	Unit	Activity
0010									500	LB	30	MIN	30	MIN				
0020									1	LB								
0030									1	LB								

Material Component Overview

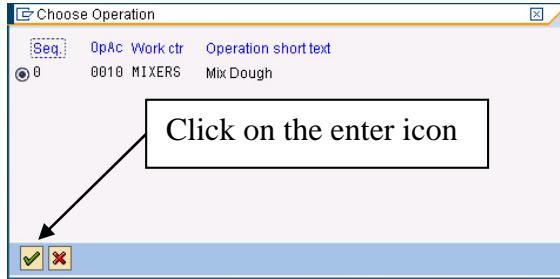
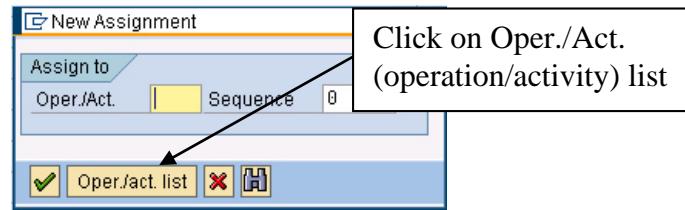
Material 00S200 Group 00GROUP Sequence 0 BOM 00000001 Alt.BOM 1

00 Dough NRG-A
00 Dough NRG-A

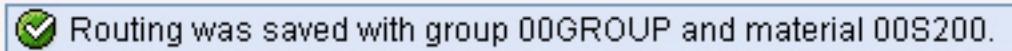
Select all components, then click on the New assignment icon

P.	Le.	Path	Itc.	Component	QTY	Unit	Activity	Machine	Unit	Activity	Unit	Activity
0	0	0010	00R380		1	LB	L	00	00	00	00	00
0	0	0020	00R420		10	GALL	L	00	00	00	00	00
0	0	0030	00R320		7	GALL	L	00	00	00	00	00
0	0	0040	00R370		5	LB	L	00	00	00	00	00
0	0	0050	00R330		50	LB	L	00	00	00	00	00
0	0	0060	00R360		50	LB	L	00	00	00	00	00
0	0	0070	00R300		50	LB	L	00	00	00	00	00
0	0	0080	00R410		50	LB	L	00	00	00	00	00
0	0	0090	00R310		50	LB	L	00	00	00	00	00
0	0	0100	00R400		50	LB	L	00	00	00	00	00

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Click on the save icon () to save the routing. You will get a message like the following:



Return to the beginning of section 2 and repeat the process to create a routing for **##S210** (dough for NRG-B bars).
All entries are the same as for **##S200** (dough for NRG-A bars).

3. Create Product Group

Many firms produce hundreds of products, and planning for each product individually is not feasible or desirable. What these firms do is create product groups, and then plan production for a small number of product groups and then transfer these plans to individual products based on historic percentages. While Fitter Snacker does not have a large of number products, we will use the product group process anyway.

To create a product group for Fitter Snacker, follow the menu path:

Logistics ▷ Production ▷ SOP ▷ Product Group ▷ Create

which will produce the following screen:

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Create Product Group: Initial Screen

Product group	00 NRG Group	00 NRG-Aand NRG-B Bars
Plant	00PT	
Base Unit	CS	<input checked="" type="button"/>

Members
 Materials
 Product groups

Enter ## NRG Group and ## NRG-A and NRG-B Bars
 Enter ##PT for Plant
 Enter CS for Base unit
 Then click on the enter icon

Create Product Group: Maintain Members (Materials)

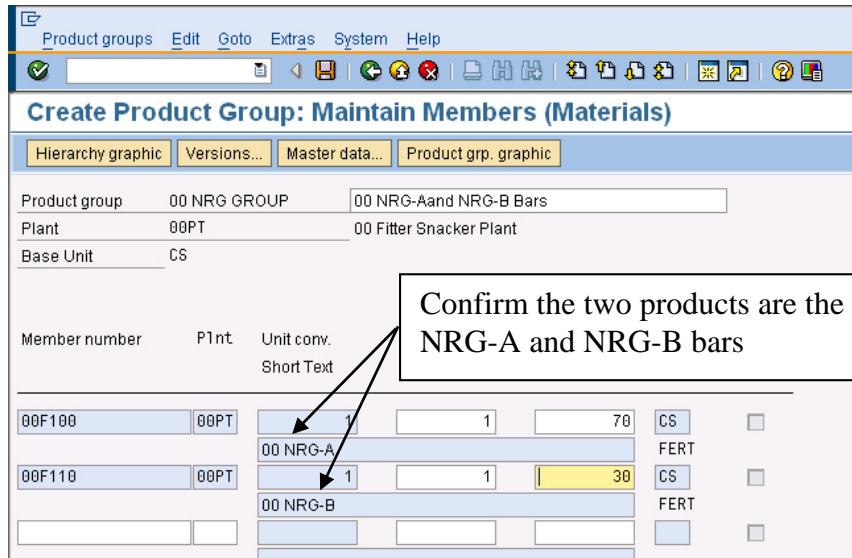
Product group	00 NRG GROUP	00 NRG-Aand NRG-B Bars
Plant	00PT	00 Fitter Snacker Plant
Base Unit	CS	

Member number	Plnt	Unit conv.	Aggr.fact.	Proportion	UoM	V M Fx
		Short Text			MTyp	
00F100	00PT		1	70		
00F110	00PT		1	30		

Enter ##F100 and ##F110 for member numbers
 Enter ##PT for Plnt, 1 for Aggr. fact. for both bars
 Enter 70 for the Proportion for NRG-A and 30 for the proportion for NRG-B bars

These proportions mean that whatever production is planned for the NRG group, it will be assumed that 70% of the production should be NRG-A bars and 30% should be NRG-B bars. Click on the enter icon () to confirm that you have the correct products in the group:

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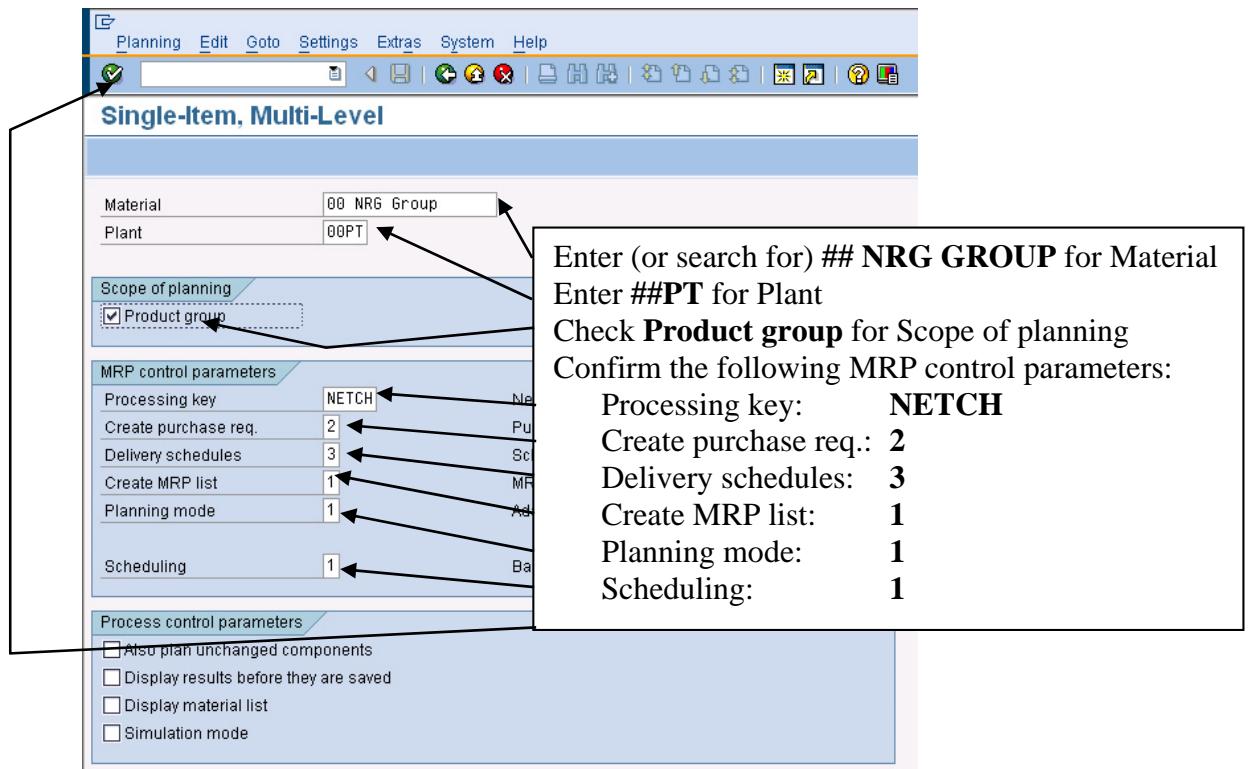


Click on the save icon (H) to save the product group.

4. Run MRP

We can run the MRP process on our new product group. To do this, follow the menu path:

Logistics ▷ Production ▷ MRP ▷ Planning ▷ Multilevel Single-Item Planning (MD02)



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Enter the information shown above, then click on the enter icon (✓). This will produce the following message:



Click on the enter icon (✓) again and you should get a report like the following:

Single-Item, Multi-Level																									
Statistics Materials planned 2 Materials with new exceptions Materials with terminated MRP list																									
Parameters Plnt 00PT Processing Key NETCH Create Purchase Requisition 2 Sched. Agreement Schedule Line 3 Create MRP List 1 Planning Mode 1 Scheduling 1																									
Database statistics No Procurement Proposals Changed																									
Run-time statistics Start of planning run 10:59:23 End of planning run 10:59:24 Planning run time 00:00:01 CPU time : Import 00:00:01																									
Ranking list for materials with highest CPU times (in ms)																									
<table border="1"><thead><tr><th>Material</th><th>Plnt</th><th>PlgRuntime</th><th>Read</th><th>Net calc.</th><th>BOM</th><th>LdTimeSched</th><th>Update</th></tr></thead><tbody><tr><td>00F100</td><td>00PT</td><td>1,206</td><td>783</td><td>31</td><td>0</td><td>0</td><td>328</td></tr><tr><td>00F110</td><td>00PT</td><td>28</td><td>16</td><td>0</td><td>0</td><td>0</td><td>11</td></tr></tbody></table>		Material	Plnt	PlgRuntime	Read	Net calc.	BOM	LdTimeSched	Update	00F100	00PT	1,206	783	31	0	0	328	00F110	00PT	28	16	0	0	0	11
Material	Plnt	PlgRuntime	Read	Net calc.	BOM	LdTimeSched	Update																		
00F100	00PT	1,206	783	31	0	0	328																		
00F110	00PT	28	16	0	0	0	11																		

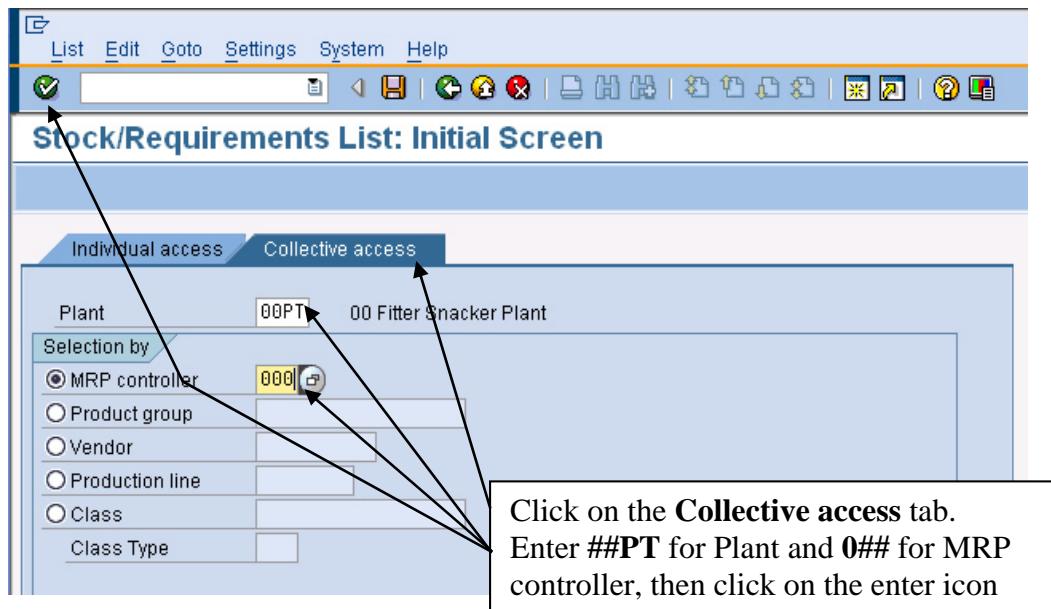
The details of your report may be different, but that is not a problem. As long as you don't have an error messages, things should be okay. To confirm that they are, we can check the status of key materials.

To view the status of a material, we can use the Stock/Requirements list. Like many transactions in the SAP system, there are a number of menu paths that can take you to the Stock/Requirements list. One of these is:

Logistics ▷ Production ▷ MRP ▷ Evaluations ▷ Stock/Requirements List (MD04)

which will produce the following screen:

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Stock/Requirements List: Material List

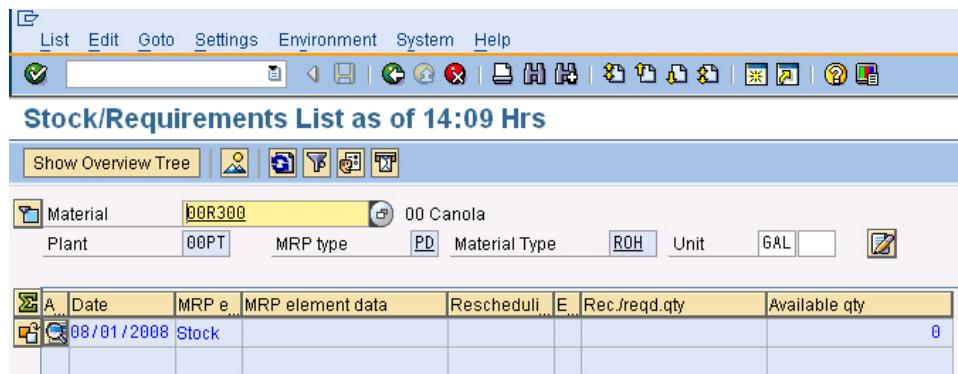
Selected stock/requirements lists Define traffic light Exception groups

Plant: 00PT 00 Fitter Snacker Plant
MRP Controller: 000 FS Controller

Light	Material	Material Description	A.	Supply	1stRDS	2nd	1	2	3	4	5	6	7	8	Plant sto...	B.	MTyp	PT	S...	A.	MT	Cde	C
CO0	00F100	00 NRG-A		999.9	999.9	999.9									0	CS	FERT	E		PD	000	<input checked="" type="checkbox"/>	
CO0	00F110	00 NRG-B		999.9	999.9	999.9									1,000	CS	FERT	E		PD	000	<input checked="" type="checkbox"/>	
CO0	00R300	00 Canola		999.9	999.9	999.9									0	GAL	ROH	F		PD	002	<input checked="" type="checkbox"/>	
CO0	00R310	00 Carob Chips		999.9	999.9	999.9									0	LB	ROH	F		PD	002	<input checked="" type="checkbox"/>	
CO0	00R320	00 Cinnamon																					
CO0	00R330	00 Cloves																					
CO0	00R340	00 Dates																					
CO0	00R350	00 Hazelnuts																					
CO0	00R360	00 Honey		999.9	999.9	999.9									0	GAL	ROH	F		PD	002	<input checked="" type="checkbox"/>	
CO0	00R370	00 Nutmeg		999.9	999.9	999.9									0	LB	ROH	F		PD	002	<input checked="" type="checkbox"/>	
CO0	00R380	00 Oats		999.9	999.9	999.9									3	44,000	LB	ROH	F		PD	002	<input checked="" type="checkbox"/>
CO0	00R390	00 Protein Powder		999.9	999.9	999.9									0	LB	ROH	F		PD	002	<input checked="" type="checkbox"/>	
CO0	00R400	00 Raisins		999.9	999.9	999.9									0	LB	ROH	F		PD	002	<input checked="" type="checkbox"/>	
CO0	00R410	00 VitMin Powder		999.9	999.9	999.9									0	LB	ROH	F		PD	002	<input checked="" type="checkbox"/>	
CO0	00R420	00 Wheat Germ		999.9	999.9	999.9									3	2,000	LB	ROH	F		PD	002	<input checked="" type="checkbox"/>
CO0	00S200	00 Dough NRG-A		999.9	999.9	999.9									0	LB	HALB	E		PD	001	<input checked="" type="checkbox"/>	
CO0	00S210	00 Dough NRG-B		999.9	999.9	999.9									0	LB	HALB	E		PD	001	<input checked="" type="checkbox"/>	

Select **## Canola** and then click on the Display Selected stock/requirements lists icon

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Click on the back icon, which will bring you back to the list of your materials. Note that there is now a check mark next to **## Canola** in the column **Already accessed**:

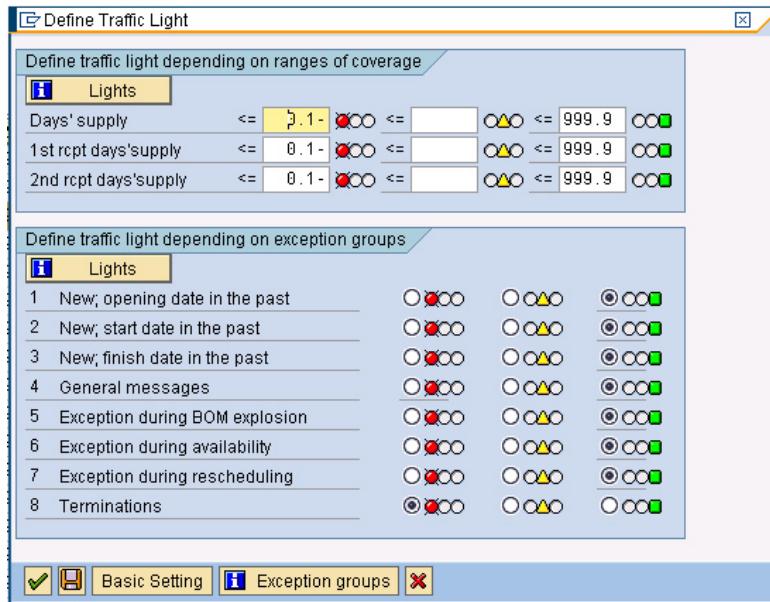
Light	Material	Material Description	Al.	Supr.	999.9	999.9	999.9
00	00F100	00 NRG-A	<input type="checkbox"/>	<input type="checkbox"/>	999.9	999.9	999.9
00	00F110	00 NRG-B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	999.9	999.9	999.9
00	00R300	00 Canola	<input checked="" type="checkbox"/>	<input type="checkbox"/>	999.9	999.9	999.9
00	00R310	00 Carob Chips	<input type="checkbox"/>	<input type="checkbox"/>	999.9	999.9	999.9
00	00R320	00 Cinnamon	<input type="checkbox"/>	<input type="checkbox"/>	999.9	999.9	999.9
00	00R330	00 Clives	<input type="checkbox"/>	<input type="checkbox"/>	999.9	999.9	999.9

This feature helps the MRP controller keep track of which materials they have already reviewed. The traffic lights also help the MRP controller focus on critical materials. The traffic light concept is used in many areas of the SAP system to help the user prioritize tasks. In our case, the materials with a red traffic light have a non-zero safety stock specified. As there have been no goods receipts for these materials, they are below their safety stock levels and, hence, the red lights.

It is possible to customize the traffic lights.

Click on the Define traffic lights icon (), which will produce the following:

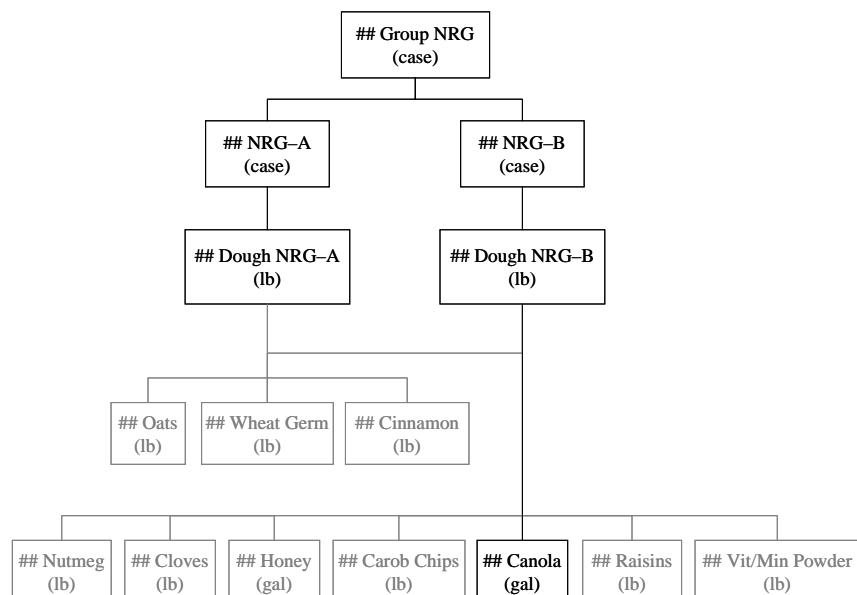
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This screen shows that the SAP system provides the user with a great deal of flexibility in how to configure the traffic light system for issuing warnings as required. Click on the cancel icon () to close this window.

We will keep the Stock/Requirements list open so that we can easily review the results of the MRP process. We will use the following materials to evaluate the MRP process (see figure below):

```
## NRG-A
## NRG-B
## Dough NRG-A
## Dough NRG-B
## Canola
```



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At this point, the Stock/Requirements list for these materials is pretty boring as there is no production scheduled.

5. Create Sales and Operations Plan

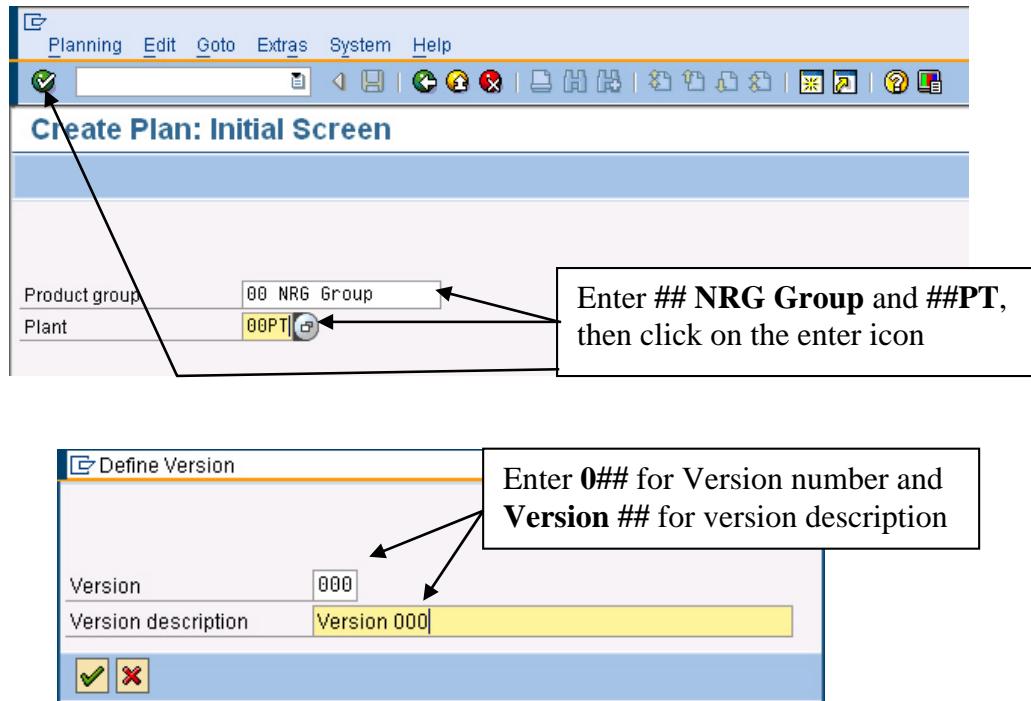
In SAP, the Sales and Operations Planning process is one way to create demand for the MRP process. In practice, Sales and Operations Planning is the process where operations and marketing agree on a demand forecast and a production plan to meet that demand. Ideally, this Sales and Operations Plan should optimize profit for the organization.

To perform Sales and Operations Planning, open a second session by following the pull-down menu path:

System→Create session

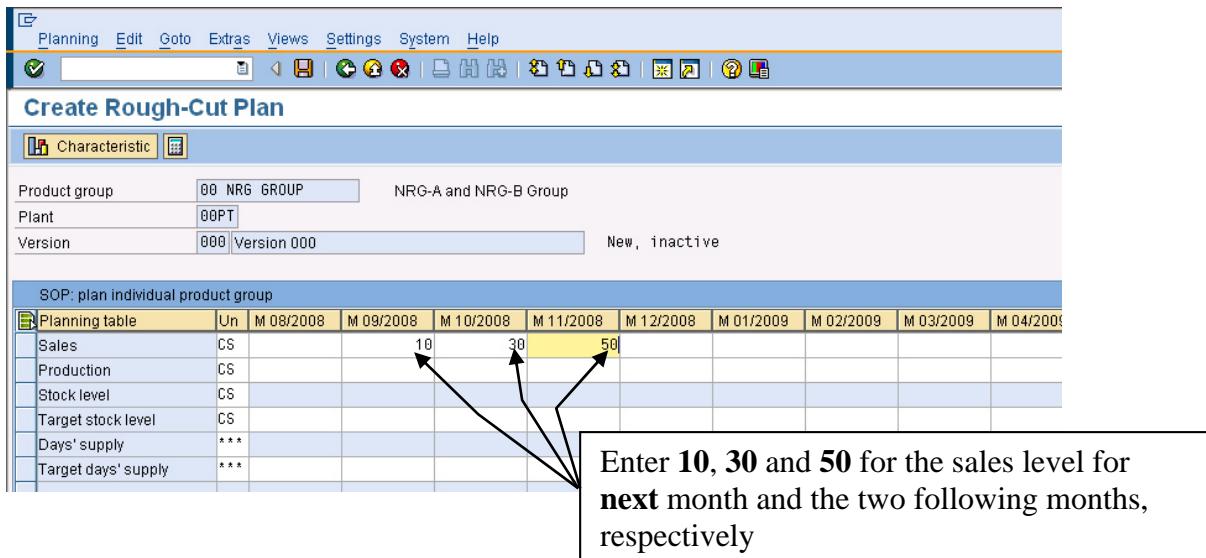
In this second session, follow the menu path:

Logistics ▷ Production ▷ SOP ▷ Planning ▷ For Product Group ▷ Create (MC81)



Click on the enter icon (✓), then the following screen will appear:

MRP

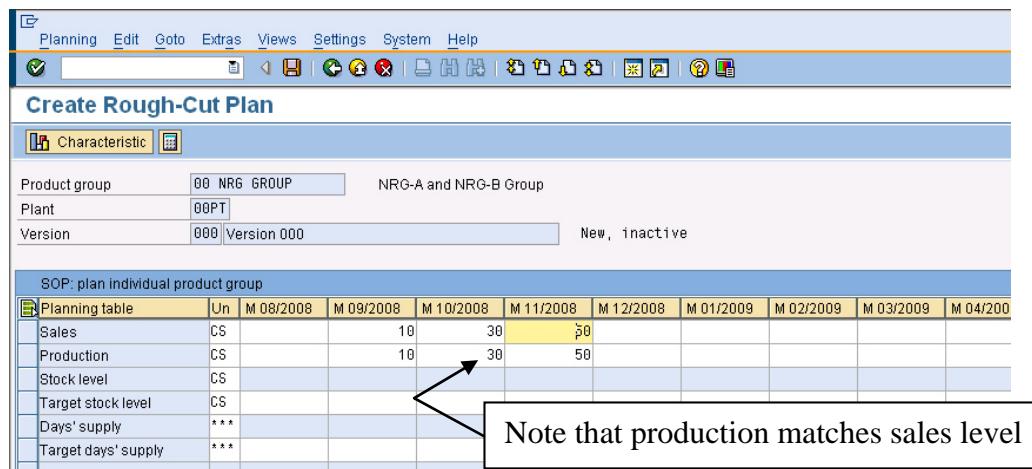


There are a number of ways to develop a sales forecast in the SAP ERP system, however, we'll just enter the values **10**, **30** and **50** as the sales level for **next** month and the two following months, respectively.

There are also a number of ways to develop a production plan—for example, we can have production match sales. To do this automatically, follow the pull-down menu path:

Edit→Create production plan→Synchronous to sales

and the system will create a production plan that exactly matches sales:



We can also develop a plan that allows for a safety stock—a stock level above the expected sales level.

MRP

Product group: 00 NRG GROUP (NRG-A and NRG-B Group)

Plant: 00PT

Version: 000 Version 000 New, inactive

SOP: plan individual product group

Planning table	Un	M 08/2008	M 09/2008	M 10/2008	M 11/2008	M 12/2008	M 01/2009	M 02/2009	M 03/2009	M 04/2009
Sales	CS		10	30	50					
Production	CS		10	30	50					
Stock level	CS									
Target stock level	CS		5	15	25					
Days' supply	***									
Target days' supply	***									

Enter 5, 15 and 25 for Target stock level

Follow the menu path:

Edit→Create production plan→Target stock level

and the system will create a production plan that allows for a Target stock level:

Product group: 00 NRG GROUP (NRG-A and NRG-B Group)

Plant: 00PT

Version: 000 Version 000 New, inactive

SOP: plan individual product group

Planning table	Un	M 08/2008	M 09/2008	M 10/2008	M 11/2008	M 12/2008	M 01/2009	M 02/2009	M 03/2009	M 04/2009
Sales	CS		10	30	50					
Production	CS		15	40	60					
Stock level	CS		5	15	25	25	25	25	25	
Target stock level	CS		5	15	25					
Days' supply	***		15	15	15					
Target days' supply	***									

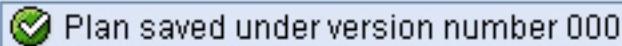
Note that the system calculates a production plan that will produce enough to meet the sales level and have the appropriate Target stock level. The system will also calculate the **Day's supply**, which is calculated as:

$$\text{Day's supply} = \frac{\text{Days in month}}{\text{Sales}} (\text{Target stock level})$$

Note that **Days in month** is taken from the factory calendar, which considers weekends, holidays and number of days in the month.

MRP

Click on the save icon (disk) to save the Sales and Operations Plan (SOP). You should get a message like the following:



6. Transfer Sales and Operations Plan to Products

Next, we have to transfer the production plan developed in the SOP transaction to the products in the product group. To do this, follow the menu path:

Logistics >Production >SOP >Disaggregation >Transfer Product Group to Planning

The screenshot shows the SAP Disaggregation interface. A dialog box titled "Transfer Planning Data to Demand Management" is open. It contains the following fields:

Product group	00 NRG GROUP	NRG-A and NRG-B Group
Plant	00PT	00 Fitter Snacker Plant
Version	000	(with a small edit icon)

Below these fields is a section titled "Transfer strategy and period" with the following options:

- Sales plan for material or PG members
- Sales plan for mat. or PG members as proportion of PG
- Production plan for material or PG members
- Prod.plan for mat. or PG members as proportion of PG

There are "From" and "To" date fields, and a checkbox for "Invisible transfer".

At the bottom is a section titled "Independent requirement specifications" with "Requirements type" and "Version" fields, and a checkbox for "Active".

To the right of the dialog, there is a callout box with instructions:

- Enter Product group ## **NRG GROUP** and Plant ##**PT**
- Enter **0##** for Version
- Select **Prod.plan for mat. or PG members as proportion of PG**
- Check **Invisible transfer**
- Check **Active**

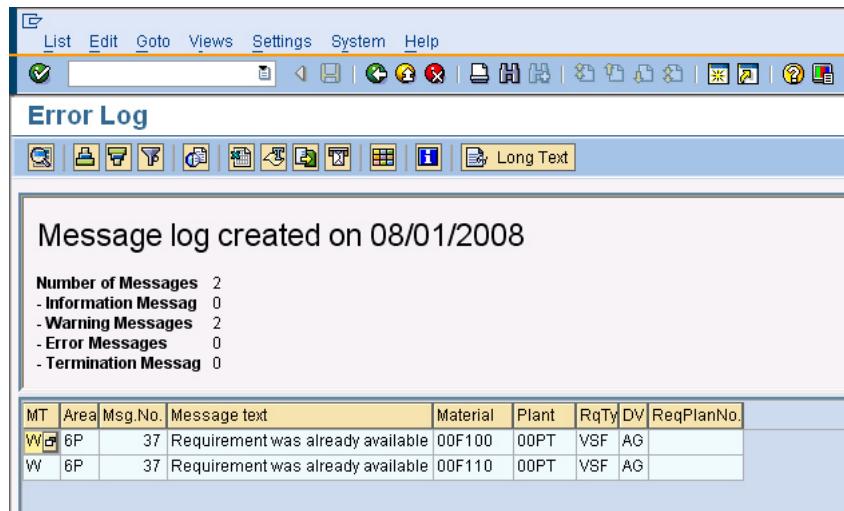
Below the callout box, it says "then click on the Transfer now icon".

Enter the information shown above, then click on the **Transfer now** icon (). This will produce the following screen:

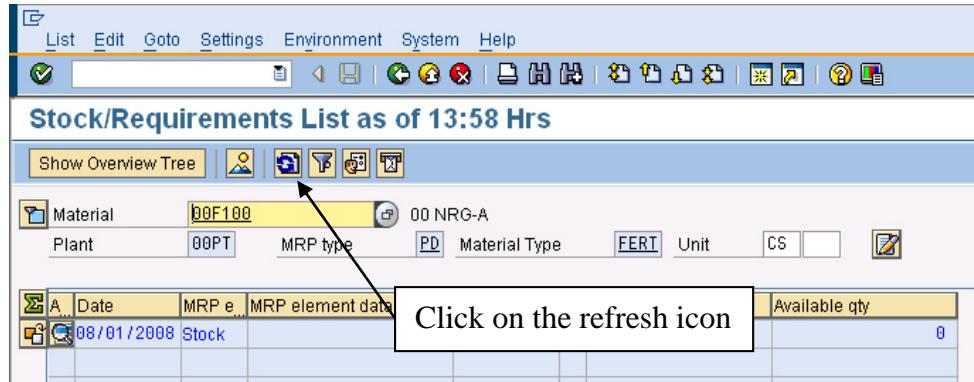


Double-check that you entered **0##** for the Version, then click on the enter icon (), which will produce the following message:

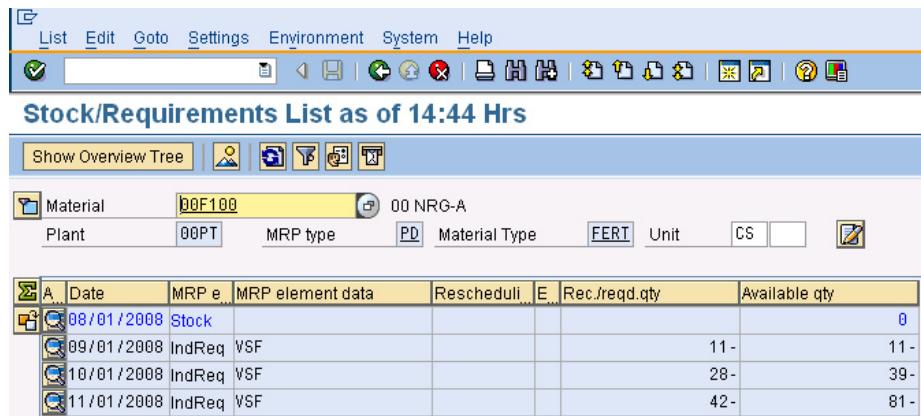
MRP



While this sounds ominous, ignore it (it's just a warning). **Switch to the other session**, make sure you have selected the material ## NRG-A and are in the Display Stock/Requirements list screen:



The results from transferring the Sales and Operations Plan are not yet displayed. To update the Stock/Requirements list, click on the refresh icon ():



MRP

Note that there are planned independent requirements for three months. Where did the quantity 11 come from in this month? In the Sales and Operations plan, the production quantity planned for NRG bars in this month was 15 (10 for sales, 5 for the target stock level). Seventy percent of 15 is 11 (actually, 10.5). Thirty percent of 15 is 4 (actually 4.5).

Check on ## Canola to verify that it has remained unchanged:

A	Date	MRP e...	MRP element data	Reschedule...	E	Rec./reqd.qty	Available qty
	08/01/2008	Stock					0

7. Create Planned Orders with MRP

To meet the demand that is predicted by the SOP process, the MRP process will create planned orders. These planned orders can be converted into production orders (for internally manufactured materials) and purchase requisitions (for externally procured materials). To do this, we will repeat the MRP process as we did before. To run MRP, switch back to the other session (the one without the Stock/Requirements List) and follow the menu path:

Logistics >Production >MRP >Planning >Multilevel Single-Item Planning (MD02)

Single-Item, Multi-Level

Planning Edit Goto Settings Extras System Help

Material: 00 NRG Group
Plant: 00PT

Scope of planning
 Product group

MRP control parameters

Processing key: NETCH	Net chan...
Create purchase req.: 2	Purchase...
Delivery schedules: 3	Schedule...
Create MRP list: 1	MRP list...
Planning mode: 1	Adapt pla...

Scheduling: 1 Basic da...

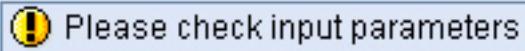
Process control parameters

Also plan unchanged components
 Display results before they are saved
 Display material list
 Simulation mode

Enter (or search for) ## NRG GROUP for Material
Enter ##PT for Plant
Check **Product group** for Scope of planning
Confirm the following MRP control parameters:
Processing key: NETCH
Create purchase req.: 2
Delivery schedules: 3
Create MRP list: 1
Planning mode: 1
Scheduling: 1

MRP

Then click on the enter icon (✓). This will produce the following message:



Click on the enter icon (✓) again and you should get a report like the following:

Single-Item, Multi-Level							
Statistics							
Materials planned	13						
Materials with new exceptions	12						
Materials with terminated MRP list							
Parameters							
Plnt	00PT						
Processing Key	NETCH						
Create Purchase Requisition	2						
Sched. Agreement Schedule Line	3						
Create MRP List	1						
Planning Mode	1						
Scheduling	1						
Database statistics							
Planned orders created	32						
Dependent requirements created	132						
Run-time statistics							
Start of planning run	13:51:47						
End of planning run	13:51:51						
Planning run time	00:00:04						
CPU time: net calc. and lot-size calc	00:00:02						
... BADI: Change char. value assgmt	00:00:01						
CPU time: BOM explosion	00:00:02						
... BADI: Alternative Explosion	00:00:01						
CPU time: update	00:00:01						
Ranking list for materials with highest CPU times (in ms)							
Material	Plnt	PlgRunTime	Read	Net calc.	BOM	LdTimeSched	Update
00F100	00PT	3,721	38	1,411	1,972	0	219
00S200	00PT	339	9	3	55	0	269
00R300	00PT	115	10	85	0	0	18
00F110	00PT	34	12	0	0	0	19
00R320	00PT	31	9	1	0	0	18
00R410	00PT	26	10	1	0	0	12

This message shows that, because of the demand we created in the SOP process, there have been a number of calculations made in the MRP process.

MRP

Switch to the session with the Stock/Requirements list, and look at the material **##F100** (NRG-A bars). Remember to use the refresh icon (↻):

Stock/Requirements List as of 14:56 Hrs						
		Show Overview Tree				
Material	00F100	Plant	00PT	MRP type	PD	Material Type
				FERT	Unit	CS
A	Date	MRP e.	MRP element data	Reschedule	E	Rec./reqd.qty
08/01/2008	Stock					0
09/01/2008	PldOrd	0000005232/STCK			7	7
09/01/2008	PldOrd	0000005233/STCK			7	14
09/01/2008	IndReq	VSF			11-	3
10/01/2008	PldOrd	0000005234/STCK			7	10
10/01/2008	PldOrd	0000005235/STCK			7	17
10/01/2008	PldOrd	0000005236/STCK			7	24
10/01/2008	PldOrd	0000005237/STCK			7	31
10/01/2008	IndReq	VSF			28-	3

Notice that the SAP system has created planned orders to meet the predicted demand

11/01/2008	PldOrd	0000005241/STCK			7	31
11/01/2008	PldOrd	0000005242/STCK			7	38
11/01/2008	PldOrd	0000005243/STCK			7	45
11/01/2008	IndReq	VSF			42-	3

Note that the SAP system has created production orders of 7 cases (which is the fixed lot size for NRG-A bars) to meet the demand. Check on the material **##S200** (dough for NRG-A bars) by entering the material number (**##S200**) and clicking on the refresh icon (↻):

Stock/Requirements List as of 14:58 Hrs						
		Show Overview Tree				
Material	00S200	Plant	00PT	MRP type	PD	Material Type
				HALB	Unit	LB
A	Date	MRP e.	MRP element data	Reschedule	E	Rec./reqd.qty
08/01/2008	Stock					0
08/31/2008	PldOrd	0000005244/STCK			500	500
08/31/2008	PldOrd	0000005245/STCK			500	1,000
08/31/2008	DepReq	00F100			500-	500
08/31/2008	DepReq	00F100			500-	0
09/30/2008	PldOrd	0000005246/STCK			500	500
09/30/2008	PldOrd	0000005247/STCK			500	1,000
09/30/2008	PldOrd	0000005248/STCK			500	1,500
09/30/2008	PldOrd	0000005249/STCK			500	2,000
09/30/2008	DepReq	00F100			500-	1,500
09/30/2008	DepReq	00F100			500-	1,000
09/30/2008	DepReq	00F100			500-	500
09/30/2008	DepReq	00F100			500-	0
10/31/2008	PldOrd	0000005250/STCK			500	500
10/31/2008	PldOrd	0000005251/STCK			500	1,000
10/31/2008	PldOrd	0000005252/STCK			500	1,500
10/31/2008	PldOrd	0000005253/STCK			500	2,000
10/31/2008	PldOrd	0000005254/STCK			500	2,500
10/31/2008	PldOrd	0000005255/STCK			500	3,000

MRP

As the dough has a lot size for dough is 500 lb., the SAP system has create planned orders in 500 lb. batches. Check on the material ##R300, Canola:

The screenshot shows the SAP Stock/Requirements List interface. The title bar reads "Stock/Requirements List as of 14:59 Hrs". The toolbar includes standard SAP icons for List, Edit, Goto, Settings, Environment, System, and Help. The main area displays a table of requirements. The columns are: A, Date, MRP e., MRP element data, Reschedule, E, Rec./reqd.qty, and Available qty. The table shows the following data:

A	Date	MRP e.	MRP element data	Reschedule	E	Rec./reqd.qty	Available qty
	08/01/2008	Stock				0	0
	08/30/2008	PldOrd	0000005256/STPO			500	500
	08/30/2008	DepReq	000S200			7-	493
	08/30/2008	DepReq	000S200			7-	486
	09/29/2008	DepReq	000S200			7-	479
	09/29/2008	DepReq	000S200			7-	472
	09/29/2008	DepReq	000S200			7-	465
	09/29/2008	DepReq	000S200			7-	458
	10/30/2008	DepReq	000S200			7-	451
	10/30/2008	DepReq	000S200			7-	444
	10/30/2008	DepReq	000S200			7-	437
	10/30/2008	DepReq	000S200			7-	430

Note that the SAP system has created a planned order for 500 gal. of Canola to meet the predicted demand.

Production Orders

Purchase Additional Raw Materials

To manufacture Snack Bars, we need to purchase the remaining raw materials. Previously, we created a purchase requisition, then used the requisition to develop a production order. This time, we will create a production order directly.

Note: We will only be purchasing and receiving the raw materials. We will not receive an invoice or make a payment to the vendor. Also, this section will only provide an overview of the purchase order process.

Please refer back to purchase order lab for any clarifications since these two labs are related.

1. Purchase Order Creation

To create a purchase order, follow the menu path:

Logistics ▷ Materials Management ▷ Purchasing ▷ Purchase Order ▷ Create
▷ Vendor Unknown (ME25)

Use order type **NB** and purchasing group **##S**.

Enter the following materials, quantities and storage location:

Material	Description	Qty	Deliv. date	Storage Location (Sloc)
##R300	## Canola	1000		100
##R310	## Carob Chips	1000	↑	100
##R320	## Cinnamon	500	Two	100
##R330	## Cloves	500	Weeks	100
##R340	## Dates	1000	From	100
##R350	## Hazelnuts	1000	Today	100
##R360	## Honey	500		100
##R370	## Nutmeg	500		100
##R390	## Protein Powder	2000		100
##R400	## Raisins	1000		100
##R410	## Vit/Min Powder	500	↓	100

For the units of each material, see the screen on page 91. For plant enter **##PT** for all items. After entering information for one row, **hit the enter key**.

Select all items, and then click on **Assign Supply Source**. On the screen that comes up, choose any vendor you wish by clicking on the row for it (but use the same source for all materials to simplify the receiving process). After selecting a vendor, click the check box on the bottom left. You will repeat the supply source selection in this way for each material separately.

Production Orders

Select all items again (by clicking the first icon on the screen menu above) and then click on Generate Purchase order (red and white circle in the menu).

Click on the item **Open requisitions** under your vendor in the vertical window on the left, then click the **Adopt** (icon (the second icon in the menu above). Save the purchase order, ignoring any system messages. You should receive a message at the bottom of the screen to the effect that a standard PO was created. **Note down this PO number.**

2. Create a Goods Receipt

To create a goods receipt, follow the menu path:

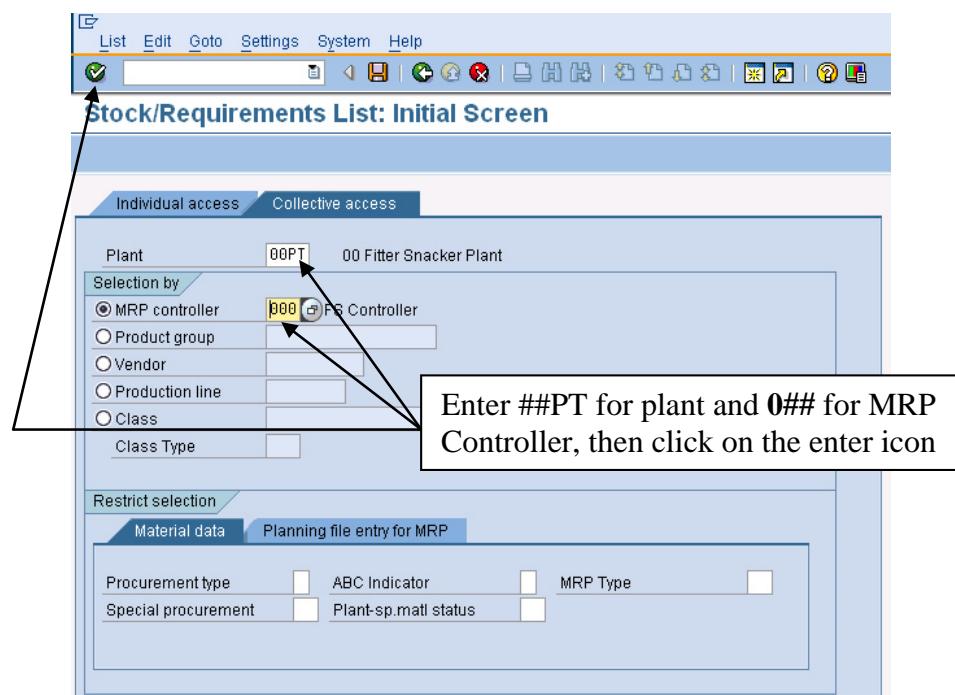
**Logistics > Materials Management > Inventory Management > Goods Movement
> Goods Receipt > For Purchase Order > GR for Purchase Order (MIGO)**

Search for your purchase order, then click on the enter icon to call up the materials on the purchase order. Click on the check mark for every item in the purchase order (under the OK column or at the bottom of the screen), then click on the **Post** icon. You should get a message to the effect that the material document was posted.

3. Check Material Levels

To view the Stock/Requirements list, follow the menu path:

Logistics > Production > MRP > Evaluations > Stock/Requirements List Collective Display



Production Orders

Enter ##PT for the plant and 0## for MRP Controller, then click on the enter icon to produce the following screen:

The screenshot shows the SAP Stock/Requirements List: Material List interface. The top menu bar includes List, Edit, Goto, System, and Help. Below the menu is a toolbar with various icons. The main title is "Stock/Requirements List: Material List". Below the title are three buttons: "Selected stock/requirements lists" (highlighted in yellow), "Define traffic light", and "Exception groups". The search bar contains "00PT". The filter section shows "Plant: 00PT 00 Fitter Snacker Plant" and "MRP Controller: 000 FS Controller". The table below lists raw materials with their descriptions, quantities, and storage details. An annotation box highlights row 00R40 with the text "Note that raw materials now exist".

Light	Material	Material Description	A	Supply	1stRDS	2nd	1	2	3	4	5	6	7	8	Plant sto	B	MTyp	PT	S	A	MTCde	C
00F100	00 NRG-A			30.0	30.0	30.0									0	CS	FERT	E		PD 000	<input checked="" type="checkbox"/>	
00F110	00 NRG-B			999.9	999.9	999.9									1,000	CS	FERT	E		PD 000	<input checked="" type="checkbox"/>	
00R300	00 Canola			999.9	999.9	999.9									1,000	GAL	ROH	F		PD 002	<input checked="" type="checkbox"/>	
00R310	00 Carob Chips			999.9	999.9	999.9									1,000	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
00R320	00 Cinnamon			999.9	999.9	999.9									500	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
00R330	00 Cloves			999.9	999.9	999.9									500	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
00R340	00 Dates			999.9	999.9	999.9									1,000	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
00R350	00 Hazelnuts			999.9	999.9	999.9									1,000	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
00R360	00 Honey			999.9	999.9	999.9									500	GAL	ROH	F		PD 002	<input checked="" type="checkbox"/>	
00R370	00 Nutmeg			999.9	999.9	999.9									500	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
00R380	00 Oats			999.9	999.9	999.9									44,000	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
00R390	00 Powdered			999.9	999.9	999.9									2,000	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
00R40															1,000	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
00R41															500	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
00R420	00 Wheat Germ			999.9	999.9	999.9									3	2,000	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>
00S200	00 Dough NRG-A			29.0	29.0	29.0										0	LB	HALB	E		PD 001	<input checked="" type="checkbox"/>
00S210	00 Dough NRG-B			999.9	999.9	999.9										0	LB	HALB	E		PD 001	<input checked="" type="checkbox"/>

You should now have inventory on hand for all raw materials.

4. Create Production Order for ## Dough NRG-A

The MRP system merely suggests production orders to the scheduler, which is why they are called **planned orders**. To create a production order, the planned order must be converted. To do this, select the material ##S200 (dough for NRG-A bars) in the Stock/Requirements list: Material List, then click on the display selected Stock/Requirement lists icon (

):

Note that all display buttons in SAP are accompanied with the picture of a pair of reading glasses

Production Orders

List Edit Goto System Help

Stock/Requirements List: Material List

Selected stock/requirements lists Define traffic light Exception groups

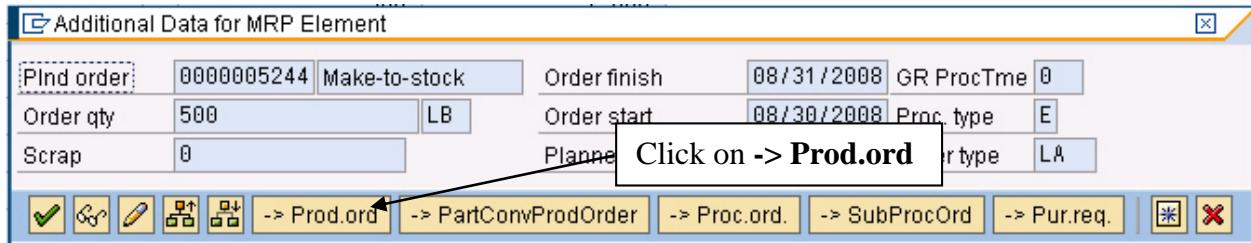
Plant	00OPT	00 Fitter Snacker Plant																				
MRP Controller	000	FS Controller																				
		Select ##S200 (dough for NRG-A), then click on display																				
Light	Material	Material Description	A	Supply	1stRDS	2nd	1	2	3	4	5	6	7	8	Plant sto	B	MTyp	PT	S	A	MTcde	C
	00S200	00 Dough NRG-A	<input type="checkbox"/>	29.0	29.0	29.0									0	LB	HALB	E		PD 001	<input checked="" type="checkbox"/>	
	00F100	00 NRG-A	<input type="checkbox"/>	30.0	30.0	30.0									0	CS	FERT	E		PD 000	<input checked="" type="checkbox"/>	
	00F110	00 NRG-B	<input type="checkbox"/>	999.9	999.9	999.9									1,000	CS	FERT	E		PD 000	<input checked="" type="checkbox"/>	
	00R300	00 Canola	<input type="checkbox"/>	999.9	999.9	999.9									1,000	GAL	ROH	F		PD 002	<input checked="" type="checkbox"/>	
	00R310	00 Carb Chips	<input type="checkbox"/>	999.9	999.9	999.9									1,000	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
	00R320	00 Cinnamon	<input type="checkbox"/>	999.9	999.9	999.9									500	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
	00R330	00 Cloves	<input type="checkbox"/>	999.9	999.9	999.9									500	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
	00R340	00 Dates	<input type="checkbox"/>	999.9	999.9	999.9									1,000	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
	00R350	00 Hazelnuts	<input type="checkbox"/>	999.9	999.9	999.9									1,000	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
	00R360	00 Honey	<input type="checkbox"/>	999.9	999.9	999.9									500	GAL	ROH	F		PD 002	<input checked="" type="checkbox"/>	
	00R370	00 Nutmeg	<input type="checkbox"/>	999.9	999.9	999.9									500	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
	00R380	00 Oats	<input type="checkbox"/>	999.9	999.9	999.9								3	44,000	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
	00R390	00 Protein Powder	<input type="checkbox"/>	999.9	999.9	999.9									2,000	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
	00R400	00 Raisins	<input type="checkbox"/>	999.9	999.9	999.9									1,000	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
	00R410	00 Vit/Min Powder	<input type="checkbox"/>	999.9	999.9	999.9									500	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
	00R420	00 Wheat Germ	<input type="checkbox"/>	999.9	999.9	999.9								3	2,000	LB	ROH	F		PD 002	<input checked="" type="checkbox"/>	
	00S210	00 Dough NRG-B	<input type="checkbox"/>	999.9	999.9	999.9									0	LB	HALB	E		PD 001	<input checked="" type="checkbox"/>	

The screenshot shows the SAP Stock Requirements List as of 21:26 Hrs. The top navigation bar includes List, Edit, Goto, Settings, Environment, System, and Help. Below the title, there are icons for Show Overview Tree, Print, Filter, and Refresh. The main area displays a table with the following columns: A (Action), Date, MRP e., MRP element data, Rescheduled, E, Rec./reqd.qty, and Available qty.

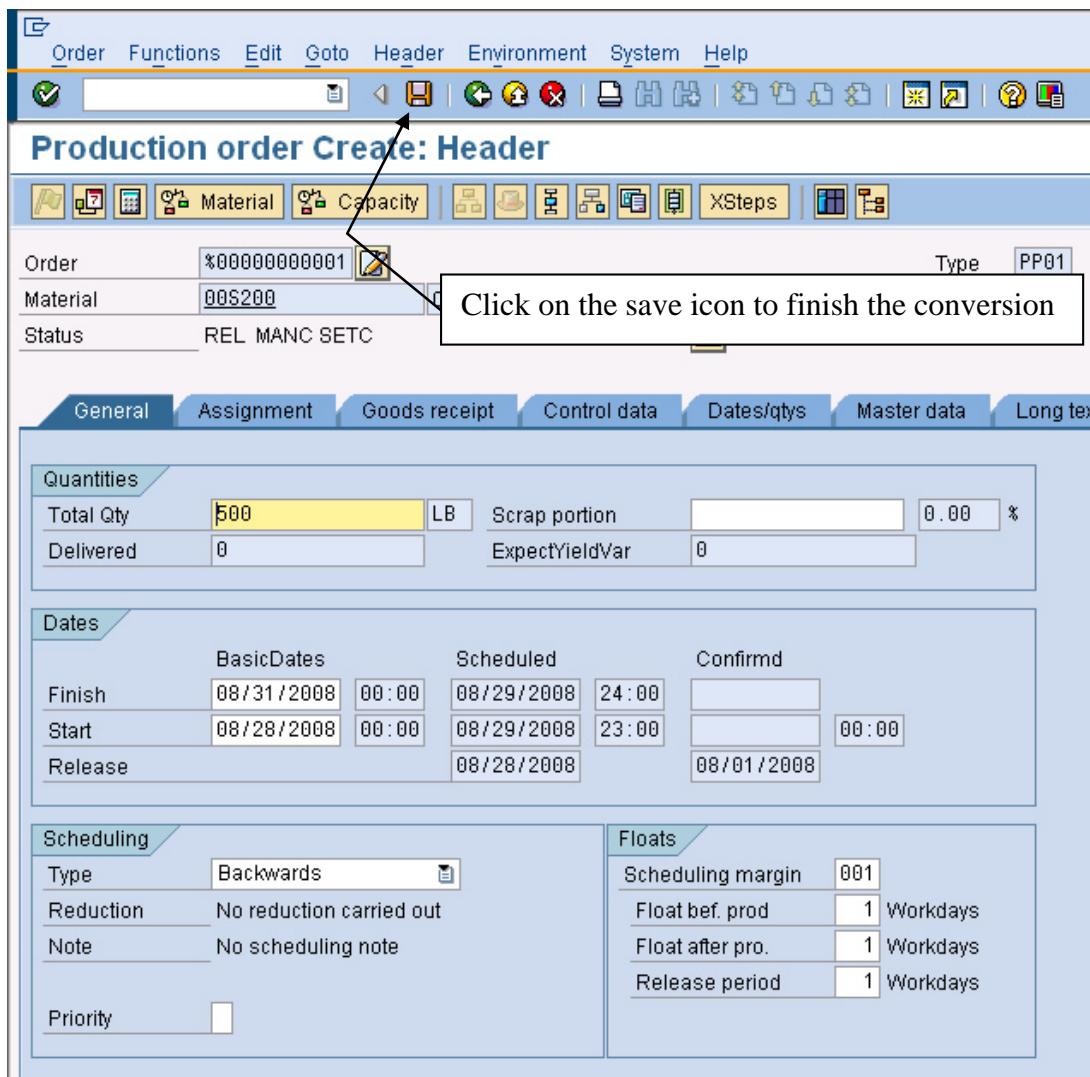
A	Date	MRP e.	MRP element data	Rescheduled	E	Rec./reqd.qty	Available qty
	08/01/2008	Stock					0
	08/31/2008	PldOrd	0000005244/STCK			500	500
	08/31/2008	PldOrd	0000005245/STCK			500	1,000
	08/31/2008	DepReq	00F100				500
	08/31/2008	DepReq	00F100				0
	09/30/2008	PldOrd	0000005246/STCK			500	500
	09/30/2008	PldOrd	0000005247/STCK			500	1,000
	09/30/2008	PldOrd	0000005248/STCK			500	1,500
	09/30/2008	PldOrd	0000005249/STCK			500	2,000
	09/30/2008	DepReq	00F100			500-	1,500
	09/30/2008	DepReq	00F100			500-	1,000
	09/30/2008	DepReq	00F100			500-	500
	09/30/2008	DepReq	00F100			500-	0
	10/31/2008	PldOrd	0000005250/STCK			500	500
	10/31/2008	PldOrd	0000005251/STCK			500	1,000
	10/31/2008	PldOrd	0000005252/STCK			500	1,500

Production Orders

Double-click on the first planned order, which should bring up the following screen:

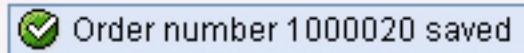


Click on the Prod.Ord button (that converts planned orders to production orders) Icon (**-> Prod.ord**), which will produce the following screen:



Production Orders

You should get a message like the following:



Switch back to the Stock Requirements list. Click on the refresh icon () to see the production order:

The screenshot shows the SAP Stock Requirements List interface. At the top, there's a toolbar with various icons. Below it, the title bar says "Stock/Requirements List as of 22:12 Hrs". The main area has several input fields: "Material" set to "005200", "Plant" set to "00PT", "MRP type" set to "PD", "Material Type" set to "HALB", and "Unit". Below these, a table lists requirements. The first row shows "Stock" for "08/01/2008". The second row, which is highlighted, shows "PrdOrd" for "08/31/2008" with the value "000001000020/PP01/Re". A callout box with a black arrow points from the text "The planned order (PldOrd) is now a production order (PrdOrd)" to the "PrdOrd" entry in the table. The table has columns labeled "Σ", "A...", "Date", "MRP e...", "MRP element data", "Reschedule", "E...", and "Rec./reqd.qty".

Σ	A...	Date	MRP e...	MRP element data	Reschedule	E...	Rec./reqd.qty
		08/01/2008	Stock				
		08/31/2008	PrdOrd	000001000020/PP01/Re			
		08/31/2008	PldOrd	0000005245/STCK			

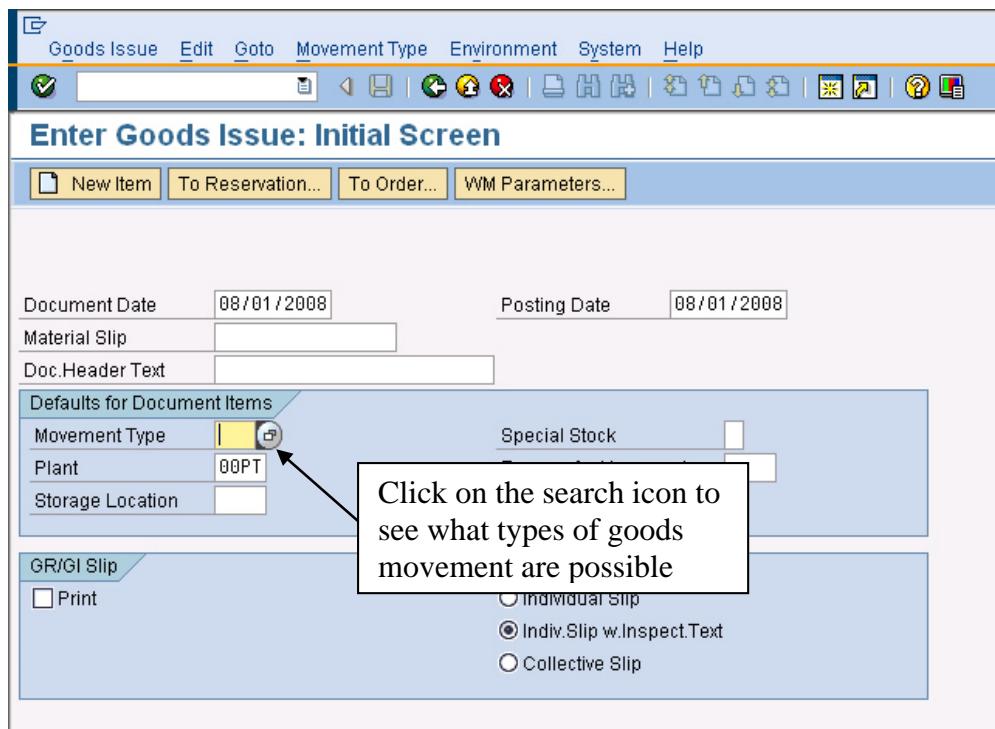
5. Goods Issue

To complete the production order for ## Dough NRG-A, we need to issue the raw materials that make up the dough so they can be taken to the mixer and mixed into dough. To issue good (raw materials) to the production order, follow the menu path:

Logistics > Production > Shop Floor Control > Goods Movement > Goods Issue (MB1A)

which will produce the following screen:

Production Orders



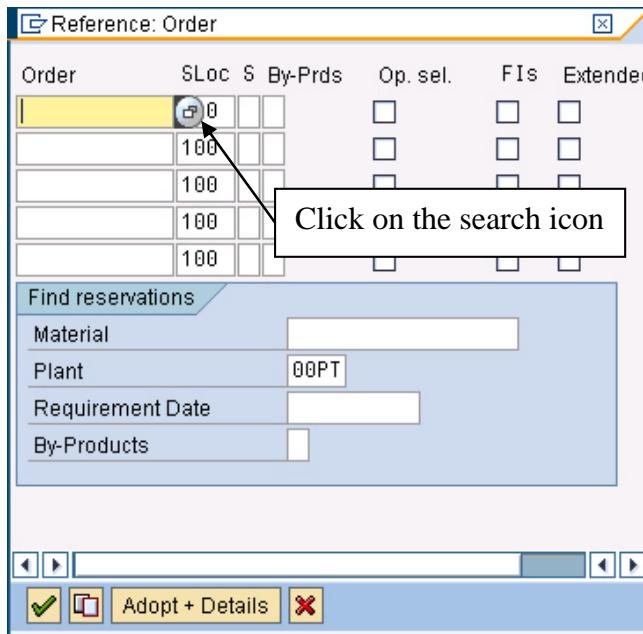
Now, you will see the types of goods movements possible:

Movement Type (2) 140 Entries found			
Restrictions			
MVT	S	Text	INDEX
201		Consumption for cost center from warehouse	201
201 K		Consumption for cost center from consignment stores	201K
201 P		Consumption for cost center from pipeline	201P
202		Consumption for cost center from warehouse - reversal	202
202 K		Consumption for cost center from consignment - reversal	202K
202 P		Consumption for cost center from pipeline - reversal	202P
221		Consumption for project from warehouse	221
221 K		Consumption for project from consignment	221K
221 Q		Consumption for project from project	221Q
222		Consumption for project from warehouse - reversal	222
222 K		Consumption for project from consignment - reversal	222K
222 Q		Consumption for project from project - reversal	222Q
231		Consumption for sales order from warehouse	231
231 E		Consumption for sales order from unrestr. sales order stock	231E
231 K		Consumption for sales order from consignment stores	231K
231 Q		Consumption for sales order from unrestricted project stock	231Q
232		Consumption for sales order from warehouse - reversal	232
232 E		Consumption for sales order from unr. sales order - reversal	232E
232 K		Consumption for sales order from consignment - reversal	232K
232 Q		Consumption for sales order from unrestricted project - rev.	232Q
241		Consumption for asset from warehouse	241
241 K		Consumption for asset from consignment	241K
242		Consumption for asset from warehouse - reversal	242
242 K		Consumption for asset from consignment - reversal	242K
251		Consumption for sales from warehouse	251

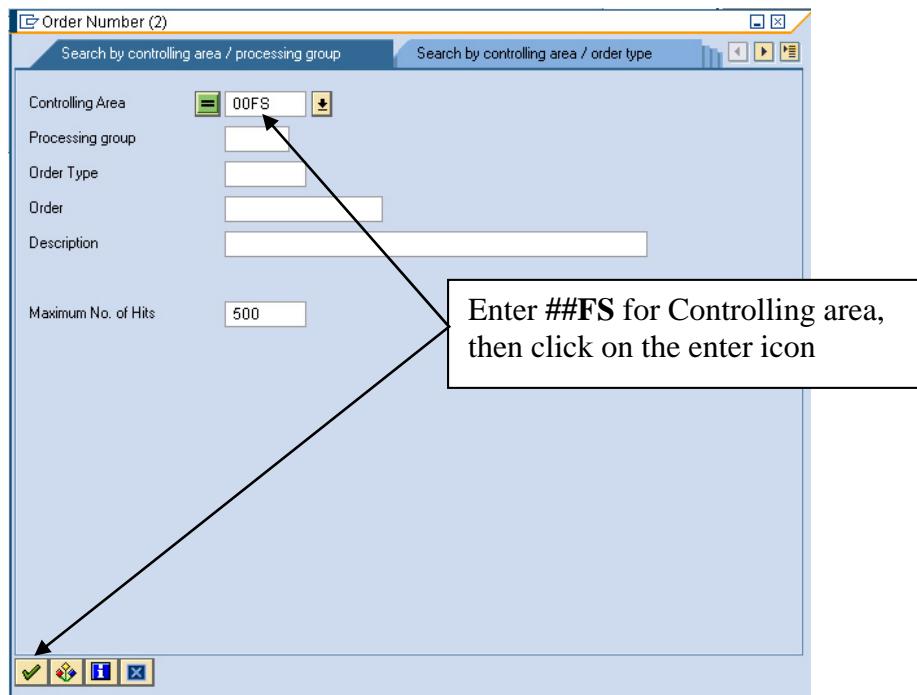
140 Entries found

Production Orders

There are a lot of types of goods movements allowed by the SAP system. Select movement type **261 (goods issue to consumption for order from warehouse)**. Enter storage location **100**, then click on the To order icon (**To Order...**):

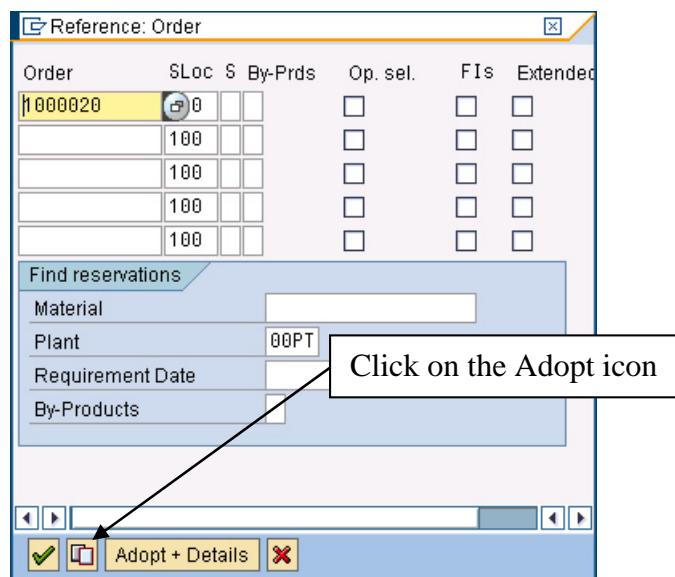
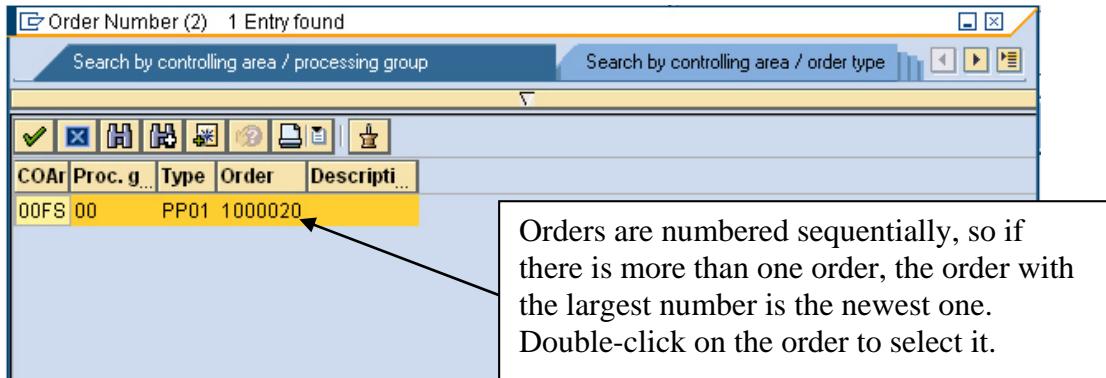


This will call up the following search screen:



Production Orders

Select your production order:



With the production order entered, click on the Adopt icon (), which will produce the following screen:

Production Orders

The screenshot shows the SAP ERP interface for 'Enter Goods Issue: Overview'. The top menu bar includes 'Goods Issue', 'Edit', 'Goto', 'Movement Type', 'Environment', 'System', and 'Help'. Below the menu is a toolbar with various icons. A callout box points to the save (post) icon in the toolbar, which is highlighted with a yellow arrow. Another callout box on the right side of the screen contains the text: 'This screen shows all of the goods that are issued to produce a batch of dough'. The main area displays a table titled 'Items' with columns: Item, Quantity, EUIn, Material, BUIn, Material Description, Pint, SLoc, Batch, Re, MvT, S, S, Reserv.No., Itm, FIs. The table lists seven items: Oats, Wheat Germ, Cinnamon, Nutmeg, Cloves, Honey, and Canola, each associated with a specific quantity and material number.

Clicking on save will confirm the goods issue. You should be returned to the **Enter Goods Issue: Initial Screen** and with the following message:

The screenshot below cannot be retrieved later, so make sure you capture it if required!



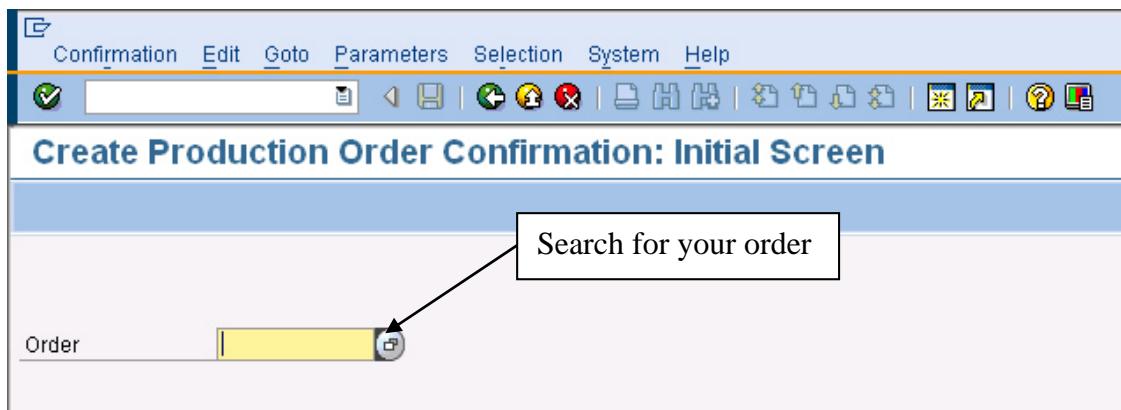
Production Orders

6. Enter Confirmation of Production

With the raw materials issued, we can mix them together to produce ## Dough NRG-A. When the dough is mixed, we need to tell the SAP system that it is available. To do this, follow the menu path:

Logistics ▷ Production ▷ Shop Floor Control ▷ Confirmation ▷ Enter ▷ For Order

It will produce the following screen:



Click on the search icon (), which will call up the following search screen:

