

The logo for M&S Food Analytics features a green vertical bar on the left and two green horizontal bars above and below the text. The text "M&S Food Analytics" is in a bold, black, sans-serif font.

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UoD Tray Bar Height
Optimization Method
SQL code and Excel method

August 1
2016

This document gives an overview of the UoD Bar Height Reduction tool for Marks and Spencer and elaborately lists down the steps and procedures to run this tool.

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1. Purpose

This document provides the reader an overview of the SQL code and calculations used to produce the output that demonstrates the bar height reductions possible for chilled products and hence the new recommended lower bar heights that will be used. The idea is to procure this list and pass on to the various suppliers and product design teams in order for them to evaluate the possibility of reducing the physical height dimension for the product, which will then free more space to pack and distribute a greater volume of product units from MNS Depot to braches.

Summary: Identify opportunities to change packaging design through analysis of UPT and existing packaging dimensions

2. Pre-requisites for Bar Height reduction tool

2.1. Software Required and Installation

- ▶ SAS Enterprise Guide (v.6.1 or higher) or SAS for Windows 9.4 or higher
 - ▶ Microsoft Excel
- In case of any software installation/issues contact M&S IT Department at 185999

2.2. Accessing the SAs Enterprise Guide Project File and UoD SAs Programme

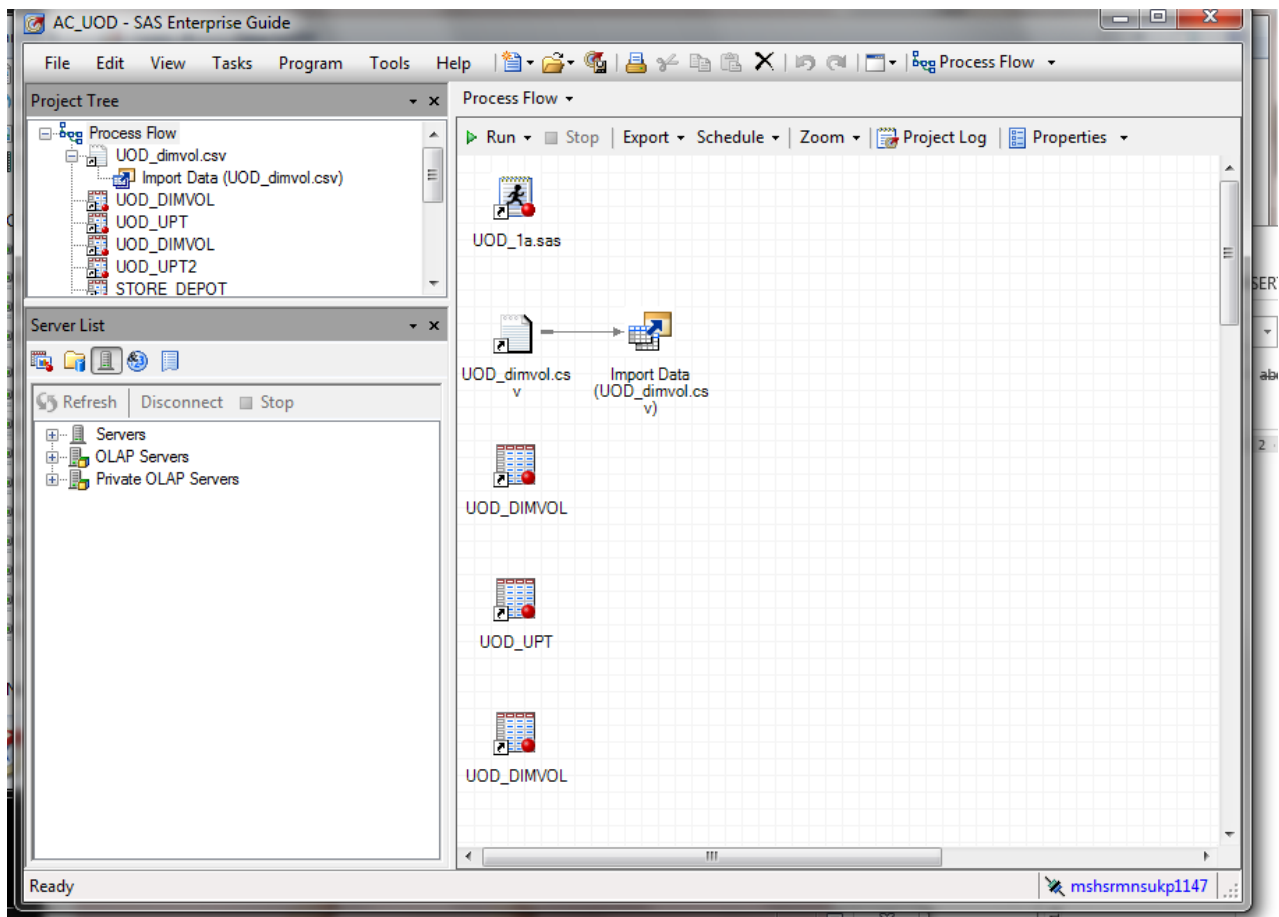
The SAS enterprise Guide Project file and UoD Program file are situated in the Handover folder on the S Drive:

S:\Supply Chain Sharepoint Site\Food Central Support\Data Team\AC\AC Store\Handover\Uod\AC_UOD.egp

- ▶ Before working on the UoD SAS programme it will be best to setup a SAS Enterprise Guide Profile.
- ▶ Open the AC_UOD.egp file, and in the bottom right hand corner of the SAS Enterprise Guide window click the given link.
- ▶ The profile window appears and you should type in the following details:

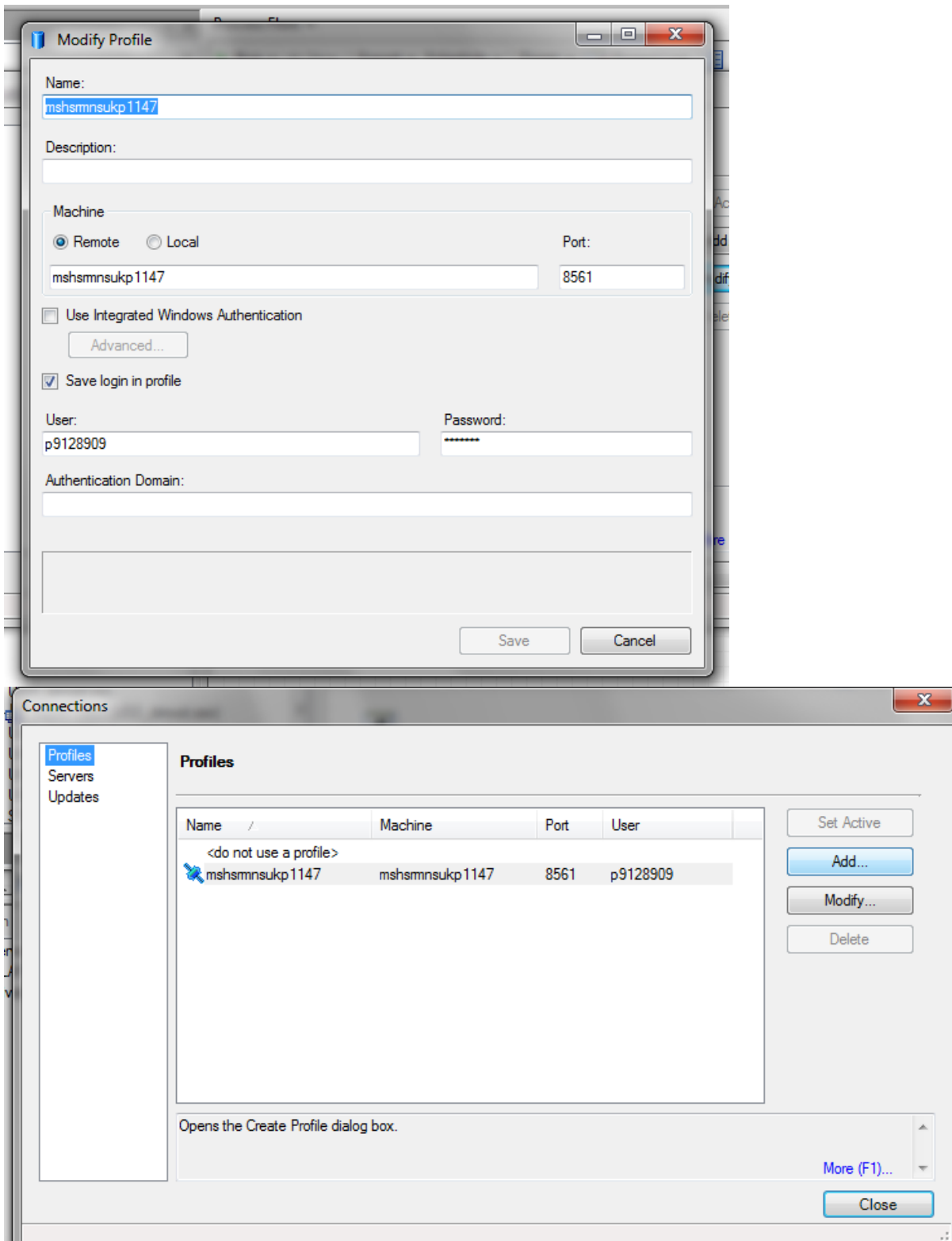
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1. Open the SAS Guide project file called 'AC_UOD.egp' stored at:
S:\Supply Chain Sharepoint Site\Food Central Support\Data Team\AC\AC Store\Handover\Uod
2. Click the profile link at bottom of SAS Enterprise Guide



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3. Click the Add button to create a new SAS user profile



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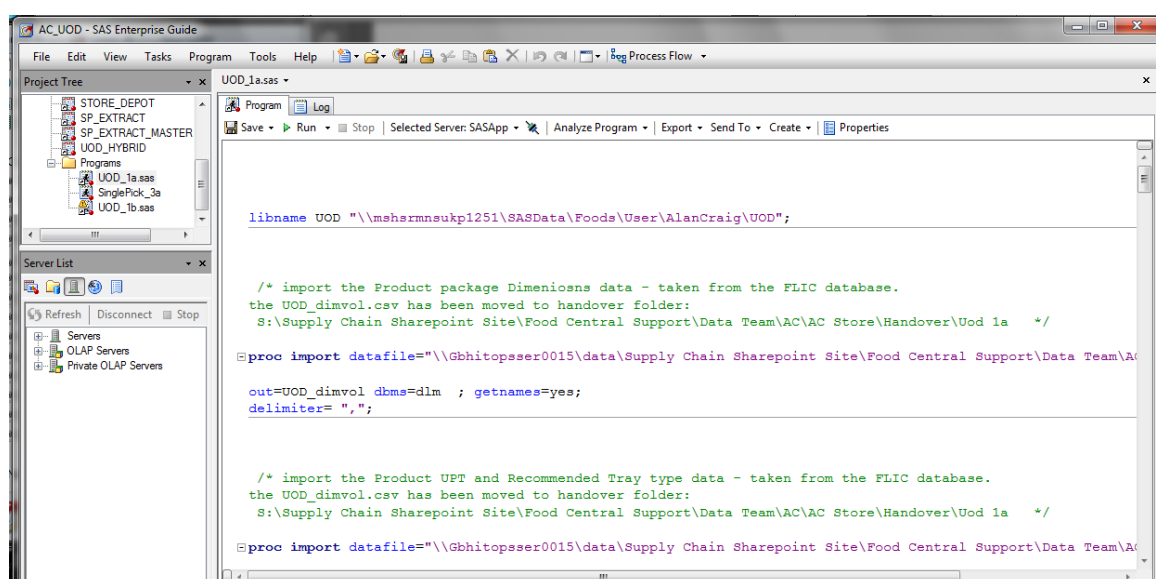
4. Click Add button to create a new SAS user profile and use the following details:

name: mshsrmsukp1147
Machine: mshsrmsukp1147
Port: 8561
User: use your MNS windows user id and password

- ▶ In the event that you cannot successfully set up a SAS profile please contact Robert Cockburn (Robert.Cockburn@marks-and-spencer.com) of the MNS Big Data team or Sam Swift, analyst for the Food Support team (Sam.Swift@marks-and-spencer.com).
- ▶ You can run the UoD program locally (ie, without a SAS profile), but this would mean moving the input datasets to a C drive location altering the file paths to reflect the local C drive locations.
- ▶ So, assuming that you now have either a successful SAS profile or you have decided to work locally then you are now ready to open and work with the Uod Bar Height SAS Programme, which generates the product lists for the Bar Height reductions.

3.Uod Bar Height SAS Program and running the code

- ▶ From the 'Project tree' panel on the left hand side, double click the 'UOD_1a.sas' icon situated under 'Programs'. This will open the Uod Bar Height reduction programme.



The screenshot shows the SAS Enterprise Guide interface. On the left, the 'Project Tree' panel displays a hierarchy of folders including STORE_DEPOT, SP_EXTRACT, SP_EXTRACT_MASTER, UOD_HYBRID, and Programs. Under Programs, UOD_1a.sas is selected. The main window displays the SAS code for UOD_1a.sas. The code includes a libname statement for UOD, two PROC IMPORT statements for datafiles, and various options like dbms=dlm, getnames=yes, and delimiter=",".

```
libname UOD "\\mshsrmsukp1251\SASData\Foods\User\AlanCraig\UOD";

/* import the Product package Dimensions data - taken from the FLIC database.
the UOD_dimvol.csv has been moved to handover folder:
S:\Supply Chain Sharepoint Site\Food Central Support\Data Team\AC\AC Store\Handover\Uod 1a */
proc import datafile="\\GbhitoPsser0015\data\Supply Chain Sharepoint Site\Food Central Support\Data Team\AC\AC Store\Handover\Uod 1a"
out=UOD_dimvol dbms=dlm ; getnames=yes;
delimiter=",";

/* import the Product UPT and Recommended Tray type data - taken from the FLIC database.
the UOD_dimvol.csv has been moved to handover folder:
S:\Supply Chain Sharepoint Site\Food Central Support\Data Team\AC\AC Store\Handover\Uod 1a */
proc import datafile="\\GbhitoPsser0015\data\Supply Chain Sharepoint Site\Food Central Support\Data Team\AC\AC Store\Handover\Uod 1a"
```

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- ▶ The two input files 'UOD_dimvol.csv' and 'FLICEquipment.csv' are stored on the server: \\Gbhitopsser0015 and the code references as folder on that server at the start of the programme. However, both these files have also been saved in the Uod Handover folder at: S:\Supply Chain Sharepoint Site\Food Central Support\Data Team\AC\AC Store\Handover\Uod\Uod 1a
- ▶ ▶ A library folder on the '\\mshsrmsukp1251' server has been created where all the SAS datasets for this UoD project are stored. This is sensible since this server should have enough capacity to store the datasets needed for this tool.
- ▶ The entire Programme code for the SAS Program is listed below. It is well commented so that each code block and each all variables and calculations are explained:

```
/* ***** */
```

```
libname UOD "\\mshsrmsukp1251\SASData\Foods\User\AlanCraig\UOD";
```

```
/* import the Product package Dimeniosns data - taken from the FLIC database.  
the UOD_dimvol.csv has been moved to handover folder:  
S:\Supply Chain Sharepoint Site\Food Central Support\Data Team\AC\AC Store\Handover\Uod 1a */
```

```
proc import datafile="\\Gbhitopsser0015\data\Supply Chain Sharepoint Site\Food Central Support\Data Team\AC\UOD_dimvol.csv"
```

```
out=UOD_dimvol dbms=dml ; getnames=yes;  
delimiter= ",";
```

```
/* import the Product UPT and Recommended Tray type data - taken from the FLIC database.  
the UOD_dimvol.csv has been moved to handover folder:
```

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```
S:\Supply Chain Sharepoint Site\Food Central Support\Data Team\AC\AC
Store\Handover\Uod 1a */
```

```
proc import datafile="\Gbhitopsser0015\data\Supply Chain Sharepoint
Site\Food Central Support\Data Team\AC\FLICEquipment.csv"
```

```
out=UOD_UPT2 dbms=dlm ; getnames=yes;
delimiter= ",";
```

```
run;
```

```
/* The next sub-query block is designed to calculate the minimum
height that can be reduced from each
UPC's packaging height dimension to effect a change in bar height for
Metric tray's only. Bar height reductions
are for 7inch to 5inch and also from 5inch to 2inch bar height
changes. */
```

```
/* Important variables and constants:Tray type for
- EQUIPMENT_TYPE: This is the designated tray comes from the type
that is recommended for each UPC based on its UPC and dimensions.
this comes from the FLIC database.
```

```
- Display_Height_mm: The height of the UPC packaging in millimetres
- cuboid_vol_ml: the cuboidal volume of the package in millimetres
cubed
- Cub_TotalProdUPTVol: the total cuboidal volume Times the UPT value.
This is the total volume that the products will occupy in
their designated tray when the number of units = UPT.
```

```
- cylinder_vol_ml: the cylindrical volume of the package in
millimetres cubed
- cyl_TotalProdUPTVol: the total cylindrical volume Times the UPT
value. This is the total volume that the products will occupy in
their designated tray when the number of units = UPT.
```

```
Constants:
```

```
- 4836.483: volume of Tray for 2inch Bar Height for the Half-Tray in
ml
- 9957.465: volume of Tray for 5inch Bar Height for the Half-Tray in
ml
- 14604.282: volume of Tray for 7inch Bar Height for the Half-Tray
in ml
- 11466.414: volume of Tray for 2inch Bar Height for the Metric-Tray
in ml
- 22155.444: volume of Tray for 5inch Bar Height for the Metric-Tray
in ml
- 33427.512: volume of Tray for 7inch Bar Height for the Metric-Tray
in ml
```


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other variables:

- Layers_METRIC_TRAY_2: Total possible number of layers in a the Metric Tray for a given UPC with a 2inch bar height
- Layers_METRIC_TRAY_5: Total possible number of layers in a the Metric Tray for a given UPC with a 5inch bar height
- Layers_METRIC_TRAY_7: Total possible number of layers in a the Metric Tray for a given UPC with a 7inch bar height

- Met_7_to5: The minimum Height needed (mm) to fit the UPT units for a given UPC in metric Tray with a 5Inch height
- Met_5_to2: The minimum Height needed (mm) to fit the UPT units for a given UPC in metric Tray with a 2Inch height

- Met_7_to5_drop: Where a UPC has 1 or more layers for the 7inch metric tray, this is the final height reduction for the UPC needed to move the product from being stored in a 7inch to a 5inch metric tray
- Met_5_to2_drop: Where a UPC has 1 or more layers for the 5inch metric tray, this is the final height reduction for the UPC needed to move the product from being stored in a 5inch to a 2inch metric tray

*/

```
proc sql;
create table y as

Select *
, Display_Height_mm - Met_7_to5 as Met_7_to5_drop
, Display_Height_mm - Met_5_to2 as Met_5_to2_drop
from (

Select *,
case when Layers_METRIC_TRAY_7 > 0 then floor(
(Display_Height_mm * 22155.444)/(Cub_TotalProdUPTVol) ) END as
Met_7_to5
, case when Layers_METRIC_TRAY_5 > 0 then floor(
(Display_Height_mm * 11466.414)/(Cub_TotalProdUPTVol) ) END as
Met_5_to2

, Display_Height_mm

from (
```

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```
Select *
,case when EQUIPMENT_TYPE = 'METRIC TRAY' then floor(11466.414
/Cub_TotalProdUPTVol) end as Layers_METRIC_TRAY_2
,case when EQUIPMENT_TYPE = 'METRIC TRAY' then floor(22155.444
/Cub_TotalProdUPTVol) end as Layers_METRIC_TRAY_5
,case when EQUIPMENT_TYPE = 'METRIC TRAY' then floor(33427.512
/Cub_TotalProdUPTVol) end as Layers_METRIC_TRAY_7

from

(
Select ud.*
,upt.AREA
,upt.CATEGORY_CODE
,upt.CATEGORY_NAME
,upt.ARTICLE_NO
,upt.ARTICLE_DESCRIPTION
,upt.EQUIPMENT_TYPE
,upt.UPT
, (upt.UPT * cuboid_vol_ml)/1000 as Cub_TotalProdUPTVol
, (upt.UPT * cylinder_vol_ml)/1000 as cyl_TotalProdUPTVol

from UOD.UOD_DIMVOL as ud
Inner Join UOD.UOD_UPT2 as upt on ud.UPC = upt.UPC
where upt.EQUIPMENT_TYPE = 'METRIC TRAY'

/* AND ud.UPC = 206310 */
) as t

) as u

) as v
where (Display_Height_mm - Met_7_to5) > 0 /* toggle this filter
to produce the 7inch to 5inch list */
/* (Display_Height_mm - Met_5_to2) > 0 */ /* toggle this filter
to produce the 5inch to 2inch list */

order by Met_7_to5_drop desc , Met_5_to2_drop
;
run;
```

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```
/* The next sub-query block is designed to calculate the minimum
height that can be reduced from each
UPC's packaging height dimension to effect a change in bar height for
Half-tray's only. Bar height reductions
are for 7inch to 5inch and also from 5inch to 2inch bar height
changes. */
```

```
/* Important variables and constants:Tray type for
- EQUIPMENT_TYPE: This is the designated tray type that comes from
the type that is recommended for each UPC based on its UPC and
dimensions.
this comes from the FLIC database.
```

```
- Display_Height_mm: The height of the UPC packaging in millimetres
- cuboid_vol_ml: the cuboidal volume of the package in millimetres
cubed
- Cub_TotalProdUPTVol: the total cuboidal volume Times the UPT value.
This is the total volume that the products will occupy in
their designated tray when the number of units = UPT.
```

```
- cylinder_vol_ml: the cylindrical volume of the package in
millimetres cubed
- cyl_TotalProdUPTVol: the total cylindrical volume Times the UPT
value. This is the total volume that the products will occupy in
their designated tray when the number of units = UPT.
```

Constants:

```
- 4836.483: volume of Tray for 2inch Bar Height for the Half-Tray in
ml
- 9957.465: volume of Tray for 5inch Bar Height for the Half-Tray in
ml
- 14604.282: volume of Tray for 7inch Bar Height for the Half-Tray
in ml
```

other variables:

```
- Layers_METRIC_TRAY_2: Total possible number of layers in a the
Half-Tray for a given UPC with a 2inch bar height
- Layers_METRIC_TRAY_5: Total possible number of layers in a the
Half-Tray for a given UPC with a 5inch bar height
- Layers_METRIC_TRAY_7: Total possible number of layers in a the
Half-Tray for a given UPC with a 7inch bar height
```

```
- Met_7_to5: The minimum Height needed (mm) to fit the UPT
units for a given UPC in Half-Tray with a 5Inch height
- Met_5_to2: The minimum Height needed (mm) to fit the UPT units
for a given UPC in Half-Tray with a 2Inch height
```

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- Met_7_to5_drop: Where a UPC has 1 or more layers for the 7inch Half-Tray, this is the final height reduction for the UPC needed to move the product from being stored in a 7inch to a 5inch Half-Tray
- Met_5_to2_drop: Where a UPC has 1 or more layers for the 5inch Half-Tray, this is the final height reduction for the UPC needed to move the product from being stored in a 5inch to a 2inch Half-Tray

*/

```
proc sql;
create table x as

Select *
,Display_Height_mm - Met_7_to5 as Met_7_to5_drop
,Display_Height_mm - Met_5_to2 as Met_5_to2_drop
from (

Select *,
case when Layers_HALF_TRAY_7 > 0 then floor(
(Display_Height_mm * 9957.465)/(Cub_TotalProdUPTVol) ) END as
Met_7_to5
, case when Layers_HALF_TRAY_5 > 0 then floor(
(Display_Height_mm * 4836.483)/(Cub_TotalProdUPTVol) ) END as
Met_5_to2

, Display_Height_mm

from (

Select *,
case when EQUIPMENT_TYPE = 'HALF TRAY' then floor(4836.483
/Cub_TotalProdUPTVol) end as Layers_HALF_TRAY_2
,case when EQUIPMENT_TYPE = 'HALF TRAY' then floor(9957.465
/Cub_TotalProdUPTVol) end as Layers_HALF_TRAY_5
,case when EQUIPMENT_TYPE = 'HALF TRAY' then floor(14604.282
/Cub_TotalProdUPTVol) end as Layers_HALF_TRAY_7

from

(
Select ud.*
,upt.AREA
,upt.CATEGORY_CODE
,upt.CATEGORY_NAME
```

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```
,upt.ARTICLE_NO
,upt.ARTICLE_DESCRIPTION
,upt.EQUIPMENT_TYPE
,upt.UPT
, (upt.UPT * cuboid_vol_ml)/1000 as Cub_TotalProdUPTVol
, (upt.UPT * cylinder_vol_ml)/1000 as cyl_TotalProdUPTVol

from UOD.UOD_DIMVOL as ud
Inner Join UOD.UOD_UPT2 as upt on ud.UPC = upt.UPC
  where      upt.EQUIPMENT_TYPE = 'HALF TRAY'

  /* AND ud.UPC      = 846165      */
) as t

) as u

) as v

where (Display_Height_mm - Met_7_to5) > 0      /* toggle this filter
to produce the 7inch to 5inch list */
  /* (Display_Height_mm - Met_5_to2) > 0      /* toggle this filter
to produce the 5inch to 2inch list */

order by      Met_7_to5_drop, Met_5_to2_drop desc
;
run;

/***** End of SAs Program *****/
```

4. Excel presentation of final result

4.1. Final Bar Height Reduction Lists

Stages 2 and 3 from the UOD_1a.sas' program will each generate two datasets:

Stage2: Metric Tray Bar Height reduction Lists:

- ▶ List 1: Metric Tray: 7inch to 5inch Bar Height reduction
- ▶ List 2: Metric Tray: 5inch to 2inch Bar Height reduction

Both of these lists are generated separately by toggling the last 'where' clause to filter the list. For the 7inch to 5inch or the 5inch to 2inch list. Both these final datasets can be copied and pasted into separate worksheets in the same Excel workbooks. The final file is attached below:



MetricCrate_Height
RedList.xlsx

- ▶ The 'Met 7 to 5' worksheet contains all the UPCs that have a recommended 7inch to 5inch Bar Height reduction. The table below provides a clear definition for each of the fields. Refer to stage 2 of the code to understand the calculation rationale and logic.

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UPC	Product code
DISPLAY_ORIENTATION	The orientation describing how the product is physically packed in the height in the tray. Assumes that height dimension of product is orientated by height in the tray
DISPLAY_WIDTH_mm	Product width in millimetres
DISPLAY_DEPTH_mm	Product Depth in millimetres
DISPLAY_HEIGHT_mm	Product height in millimetres
UNIT_NET_WEIGHT_g	Weight of food contents in grams
cuboid_vol_ml	the cuboidal volume of the package in millimetres cubed
Cylinder_Vol_ml	the cylindrical volume of the package in millimetres cubed
CATEGORY_CODE	The food Category code that the UPC belongs to
CATEGORY_NAME	The food Category name that the UPC belongs to
Article_No	Unique UPC ID
ARTICLE_DESCRIPTION	Product Name
EQUIPMENT_TYPE	Designated Tray Type
UPT	The Units Per Tray (UPT) value: integer
Vendor_Name	Name of Product Supplier
Cub_TotalProdUPTVol	the total cuboidal volume Times the UPT value. This is the total volume that the products will occupy in their designated tray when the number of units = UPT
cyl_TotalProdUPTVol	the total cylindrical volume Times the UPT value. This is the total volume the products will occupy in their designated tray when the number of units = UPT
Layers_METRIC_TRAY_2	Total possible number of layers in a the Metric Tray for a given UPC with a 2inch bar height
Layers_METRIC_TRAY_5	Total possible number of layers in a the Metric Tray for a given UPC with a 5inch bar height
Layers_METRIC_TRAY_7	Total possible number of layers in a the Metric Tray for a given UPC with a 7inch bar height
Met_7_to5	The minimum Height needed (mm) to fit the UPT units for a given UPC in metric Tray with a 5Inch height
Met_7_to5_drop	Where a UPC has 1 or more layers for the 7inch metric tray, this is the final height reduction for the UPC needed to move the product from being stored in a 7inch to a 5inch metric tray
%Drop	The percentage (%) to reduce the UPC packaging height to permit a reduced bar height from 7inch to 5inch

- ▶ The 'Met 5 to 2' worksheet contains all the UPCs that have a recommended 5inch to 2inch Bar Height reduction. The table below provides a clear definition for each of the fields. Refer to stage 2 of the code to understand the calculation rationale and logic.

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UPC	Product code
DISPLAY_ORIENTATION	The orientation describing how the product is physically packed in the height in the tray. Assumes that height dimension of product is orientated by height in the tray
DISPLAY_WIDTH_mm	Product width in millimetres
DISPLAY_DEPTH_mm	Product Depth in millimetres
DISPLAY_HEIGHT_mm	Product height in millimetres
UNIT_NET_WEIGHT_g	Weight of food contents in grams
cuboid_vol_ml	the cuboidal volume of the package in millimetres cubed
Cylinder_Vol_ml	the cylindrical volume of the package in millimetres cubed
CATEGORY_CODE	The food Category code that the UPC belongs to
CATEGORY_NAME	The food Category name that the UPC belongs to
Article_No	Unique UPC ID
ARTICLE_DESCRIPTION	Product Name
EQUIPMENT_TYPE	Designated Tray Type
UPT	The Units Per Tray (UPT) value: integer
Vendor_Name	Name of Product Supplier
Cub_TotalProdUPTVol	the total cuboidal volume Times the UPT value. This is the total volume that the products will occupy in their designated tray when the number of units = UPT
cyl_TotalProdUPTVol	the total cylindrical volume Times the UPT value. This is the total volume the products will occupy in their designated tray when the number of units = UPT
Layers_METRIC_TRAY_2	Total possible number of layers in a the Metric Tray for a given UPC with a 2inch bar height
Layers_METRIC_TRAY_5	Total possible number of layers in a the Metric Tray for a given UPC with a 5inch bar height
Layers_METRIC_TRAY_7	Total possible number of layers in a the Metric Tray for a given UPC with a 7inch bar height
Met_5_to2	The minimum Height needed (mm) to fit the UPT units for a given UPC in metric Tray with a 2Inch height
Met_5_to2_drop	Where a UPC has 1 or more layers for the 5inch metric tray, this is the final height reduction for the UPC needed to move the product from being stored in a 7inch to a 5inch metric tray
%Drop	The percentage (%) to reduce the UPC packaging height to permit a reduced bar height from 5inch to 2inch

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Stage 3

Stages 3 from the UOD_1a.sas' program will each generate two datasets:

Stage3: Half-Tray Bar Height reduction Lists

- ▶ List 1: Half-Tray: 7inch to 5inch Bar Height reduction
- ▶ List 2: Half-Tray: 5inch to 2inch Bar Height reduction

Both of these lists are generated separately by toggling the last 'where' clause to filter the list For the 7inch to 5inch or the 5inch to 2inch list. Both these final datasets can be copied and pasted Into separate worksheets in the same Excel workbooks. The final file is attached below:



HalfCrate_HeightRedList.xlsx

The half-tray output file is arranged in exactly the same way as the Metric tray output file. The 'Half_7_to5' worksheet contains the half-tray 7inch to 5inch Bar Height reduction and the 'Half_5_to2' worksheet contains the half-tray 5inch to 2inch Bar Height reduction list. The Field name and definitions are analogous to those shown above for the Metric tray worksheets.

4.2 Single UPC Excel Bar Height Calculator

The use of SAS or any other SQL orientated tool facilitates a higher level of calculations for many UPCs and can process large datasets more efficiently. However, the basic calculations were worked out using Excel for single UPCs and then scaled up in SAS to enable calculations for multiple UPCs. The Excel tool was developed to help demonstrate the tool for end-users, and this tool is available at:

S:\Supply Chain Sharepoint Site\Food Central Support\Data Team\AC\AC Store\Handover\Uod\Uod 1a\ Uod1a Bar Height Calculator .xlsx

The layout is very simple: tray dimensions millimetres (fixed), Product Dimensions, Layers, and Bar Height Reduction. Essentially, you can insert the product dimensions for any given product in the cells coloured yellow and then the remaining cells that are formula driven will change. The main output cell is called 'Reduction mm' and this provides the height in millimetres for the given example product (Beef Lasagne). So given that Beef Lasagne occupies 2 full layers within a metric tray with 7-inch bar height for a UPT of 24 then we are interested in fitting 24 UPTs in the next possible bar height which is 5-inches. Hence, the 'Next lowest Bar Height Volume (mm)' value uses the volume of the Tray for 5-icnh bar height which is 22155.444 ml. Finally, using simple proportions calculations we subtract the

minimum height that need to be subtracted for 24 UPTs to allow those 24 unit to fit inside the 5-inch bar height. The calculation is:

(Height of Product (mm) X Next lowest Bar Height Volume (ml))

UPT Tot Vol (ml)

This value of 44 mm is generated and if we subtract the height of the beef lasagne of 55mm then we arrive at our final recommendation which is 11mm. An 11mm reduction will therefore facilitate a bar height reduction for Beef Lasagne from a 7-inch metric to a 5-inc metric. If you enter product height as 44mm in the Product Height Cell (G15) then it will be clear that 1 full layer is now possible since the row 'Does UPT Vol Fit in Tray' changes to '1' under the 'METRIC_TRAY_5' column. For this UPC, its dimension information can be entered into the yellow cells to identify product height reduction opportunities. The SAS code will perform the same calculation as the excel tool, and generate candidate product lists which in themselves are not the final lists. These lists can be passed to suppliers for them consider the practicalities of reducing the heights of any of the products in the list.

The screenshot shows an Excel spreadsheet with the following data tables:

Tray Dimensions						
TRAY_TYPE	HALF_TRAY_2	HALF_TRAY_5	HALF_TRAY_7	METRIC_TRAY_2	METRIC_TRAY_5	METRIC_TRAY_7
TRAY_WIDTH (mm)	369	369	369	549	549	549
TRAY_DEPTH (mm)	257	257	257	354	354	354
TRAY_HEIGHT (mm)	51	105	154	59	114	172
Vol_ml	4836.48	9957.47	14604.28	11466.41	22155.44	33427.51

Product Dimensions								
UPC	DISPLAY_ORIENTATION	DISPLAY_WIDTH	DISPLAY_DEPTH	DISPLAY_HEIGHT	Product Name	UPT	Vol (ml)	UPT Tot Vol (ml)
206310	H	158	130	55	BEEF LASAGNE	24	1129.7	27112.8

Layers						
	HALF_TRAY_2	HALF_TRAY_5	HALF_TRAY_7	METRIC_TRAY_2	METRIC_TRAY_5	METRIC_TRAY_7
Tray Vol/ UPT Product Vol	0.178	0.367	0.539	0.423	0.817	1.233
Does UPT Vol Fit in Tray	0	0	0	0	0	1

Bar Height Reduction		
	volume (ml)	height (mm)
UPT Tot Vol (ml)	27112.8	55
Next lowest Bar Height Volume (ml)	22155.444	44
Reduction mm		11

Summary: Beef Lasagne (UPC: 206310) occupies 2 complete layers of a Metric Tray with a 7 Inch Bar height. It would require a 11 mm reduction in the product height to allow this UPC to be fitted inside a 5inch bar height of a metric tray at its recommended UPT of 24.

END of Document