

## Calculation

In order to estimate the financial consequences of a planned production it is necessary to analyse and describe a number of financial and time-related factors concerning the individual product.

Besides providing necessary information that describes the future consequences of a given production, these descriptions, in the form of recipes, also form the basis for efficient follow-up on deviations between the expected and the actual production.

### Recipes

NAVImeat recipes are located in the Calculation module and constitute the central components of the system. The recipes serve three primary purposes:

- To estimate and control cost prices
- To serve as sources of information in the planning process
- To contain standard information used for production monitoring and deviation reports

To facilitate financial follow-up, the system incorporates a large number of control parameters that ensure that various cost items are taken into consideration and that these are correctly and automatically processed.

It is, for example, possible to relate different cost types to quantities of intake and output. Consequently, estimates of cost prices are always correct and true.

### Slaughtering vs. meat-processing

Several companies within the industry are characterised by having slaughterhouses as well as meat-processing divisions. Recipes are designed and structured differently for the two types of production.

The structure of S-recipes from slaughtering must take into account that intake consists only of one raw material product, whereas output is divided into two or more main products and secondary products.

As for P-recipes for meat processing the structure is the opposite. Input consists of a number of raw materials, semi-processed products and additives, whereas output consists of only one product.

NAVImeat handles both process types, creating a logical coherence between the different types of recipes.

In order to handle both types of production, NAVImeat operates with different types of recipes:

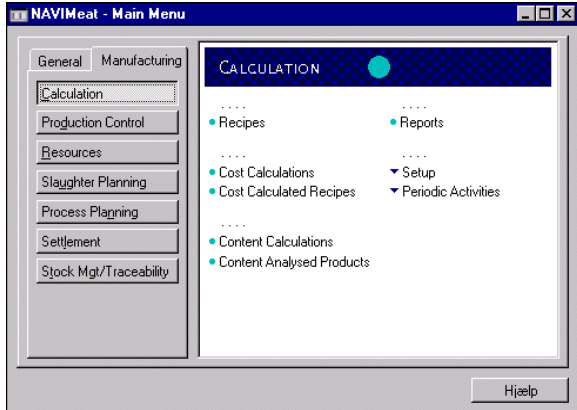
- Slaughtering recipes
- Cutting recipes
- Deboning recipes
- Processing recipes
- Group recipes

### Slaughtering recipes / S-recipes

This type of recipe is used at animal type level to describe the process from intake to main product, secondary product and plucks. The distribution between different parts of the output is stated in relative terms to eliminate problems concerning variation in animal weight.

### Cutting recipes / S-recipes

Cutting recipes are also used at animal type level. These recipes describe the estimated distribution between various cuts. The distribution is described in relative terms, and it is possible to operate with several main products.



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If different qualities are involved, and this must be reflected in the calculations, it is possible to define an unlimited number of recipes.

This may also form the basis for precise follow-up on yields from different cuttings based on different qualities.

### Deboning recipes / S-recipes

Deboning recipes are used at part piece level to describe the process from intake to main product and secondary products. At this level, it is possible to calculate the cost price of main products since each cost and yield element of the recipe is taken into account as is shrinkage/weight gain.

NAVIMEAT calculates main product cost prices according to the following formula:

$$\begin{aligned}
 & \text{(Price of raw materials per kilo} \\
 & \text{multiplied by no. of intake kilos} \\
 & + \text{ processing costs} \\
 & - \text{ price per kilo of secondary} \\
 & \text{product multiplied by weight} \\
 & \text{of secondary product)} \\
 & \underline{\hspace{1.5cm} / \text{ weight of main product}} \\
 & = \text{Cost price per kilo main product}
 \end{aligned}$$

Cost prices and secondary product prices can be determined by the company. The prices of secondary products can, for example, be fixed at the estimated market value with a view to calculating the real cost price of the main product if secondary products are sold externally. It is also possible to use an internal price.

### Processing recipes / P-recipes

Recipes that are used in processing contain several intake products and only one or few output products. This, for example, applies to the production of sausages and salami.

The design of processing recipes can be based on a chain structure (see below), or the entire process can be described in one recipe containing all parts of the process and all yield percentages.

There are advantages to both types of design structure. However, the flexibility of the system allows the company to choose a model to suit the current situation. It is also possible to combine the two models.

### Group recipes

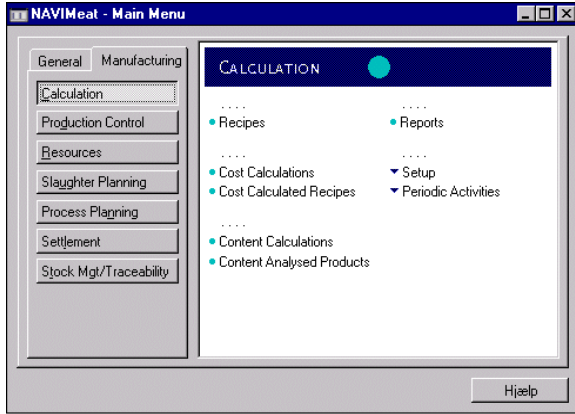
NAVIMEAT includes group recipes which minimise registrations at production level by jointly weighing out the secondary products.

Group recipes are used for producing recipes in connection with main products that only differ a little. When group recipes are used, secondary products are jointly weighed out on the completion of the recipe. Subsequently, NAVIMEAT automatically distributes secondary products according to the weight distribution of the main products. This allows for efficient follow-up on main products, while significant savings are obtained on production registration costs.

### S-recipe information

NAVIMEAT S-recipes contain the following standard information:

- Standard yield percentages
- Derived secondary products
- Shrinkage percentages
- Cold store and transport shrinkage
- Packaging type/consumption
- Standard time consumption for machines and staff
- Throughput and waiting time



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### P-recipe information

P-recipes, for example, contain the following information:

- Intake and output quantities
- Standard yield percentages
- Shrinkage percentages
- Minimum and maximum fat percentages
- Chopping sizes
- Standard time consumption
- Description of nutritional contents

### Chain structure ensures recipe coherence

The chain structure connects the individual recipes with a view to calculating cost prices of semi-processed and processed products. This chain structure can contain an unlimited number of levels. The business hence obtains a high degree of flexibility in respect of the level of subsequent follow-up. Provided that individual recipes are adequately described, the chain structure further ensures that products need to be described only once. Subsequently, products may, in principle, be combined according to the LEGO brick principle – as semi-processed or processed products.

These recipe chains also form the basis of calculations of material consumption and capacity load in the Planning module.

If the cost prices of one product that appears in several recipes are changed, NAVI Meat contains facilities that ensure a re-calculation of the cost price of all recipes affected by the changed product.

### Calculation of nutritional contents helps development phase

A unique feature in NAVI Meat allows you to calculate the nutritional contents of the end-product on

the basis of parameters such as meat, protein and fat content. In connection with customising and developing P-recipes, this feature will ensure that end-products are kept within the defined limits for nutritional content. In connection with the calculation of nutritional contents, the system also generates a list of allergens.

### Logical error elimination

When recipes are calculated, their design and logic are also validated. Therefore, each recipe contains an error status mark. After each calculation, an error list can be printed, stating the location and the nature of errors found. Validation prevents recipes with errors from being used in the production or from being further processed. This restores confidence in calculated cost prices.

### Credible cost prices and prospects

By way of the calculation related to the recipes, the company can establish a connection between non-realised production potential and future earnings. NAVI Meat makes it possible to gain maximum control over the production before it has even started. The calculated recipes further make it possible to monitor the production currently – in the Production Control module – allowing efficient follow-up of deviations.

For many businesses, the introduction of the NAVI Meat calculation module will improve earnings significantly since decisions will be made on the basis of more precise and reliable estimates of the cost prices of various products.