

### DMRI Pork Pricing methodology & work plan

1. Project start – Team set-up and model definition	2 weeks
2. Data gathering	3 weeks
3. Implementation of the software module	2 weeks
4. Model validation	1 week
5. Presentation and training of the staff	1 week
6. Follow-up visits	1 week

6 months

### DMRI Pig Purchasing & Sorting methodology & work plan

1. Screening and analysis	
2. Project start – Investigation of current infrastructure	2 weeks
3. Design & specification of needed physical modifications	2 weeks
4. Implementation of needed physical modifications	4 weeks
5. Development of a Yield Model	3 weeks
6. Data analysis and proposal of criteria	1 week
7. Implementation of the software module	2 weeks
8. Model validation	1 week
9. Presentation and training of the staff	1 week
10. Follow-up visits	1 week

6 months

Use of tools to maximize profit

## Customer segmentation

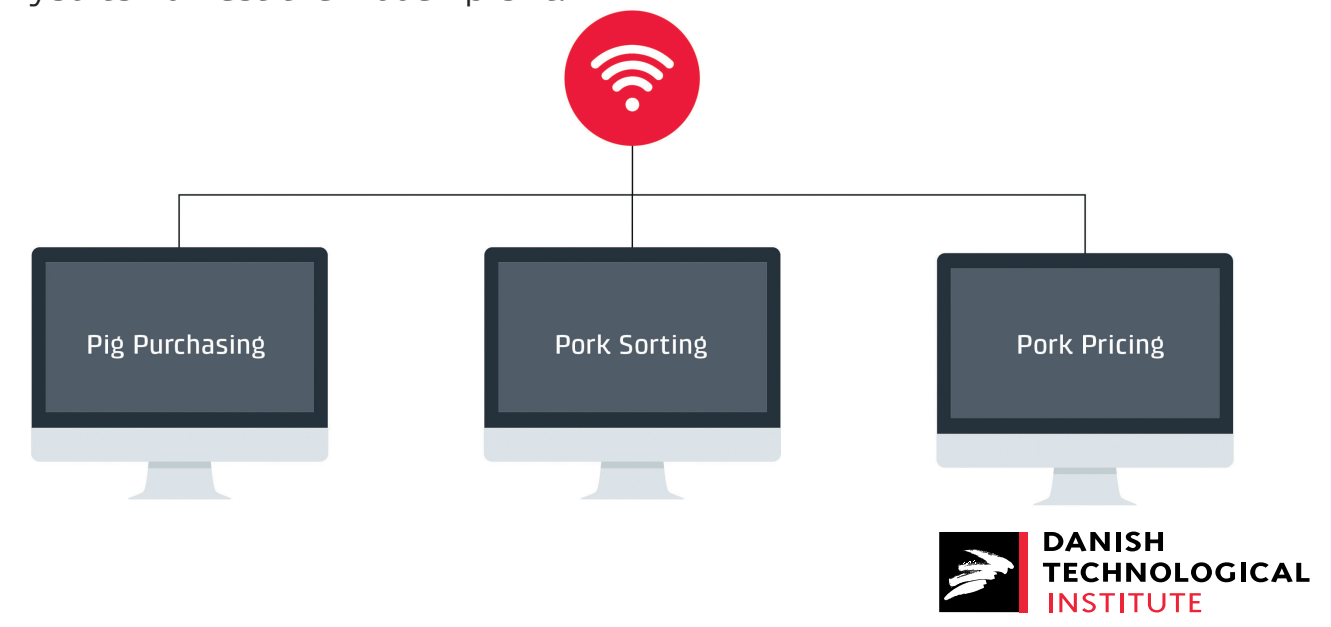


Grading tool / Infrastructure / Traceability



## DMRI Pork Profit<sup>®</sup> – a suite of services boosting your profit

Pigs are the greatest asset to meat companies, many of them do not exploit the full potential in maximizing the profit throughout the value chain. DMRI has developed a full suite of services & tools that will assist you to harvest the hidden profit!



**Jesús Manuel Siles Aceña**  
Senior Consultant  
DMRI  
Cell: +45 72201105  
jsil@teknologisk.dk  
[www.dmri.com](http://www.dmri.com)



**DANISH TECHNOLOGICAL INSTITUTE**



# The value creation – key questions

From the farm to the market, the value creation at the pork meat industry is determined by how the pigs, characterised by their breed, provenance and natural variation, match the sales, which are the expression of the choice between different products, specifications, prices and available volumes. And, conversely, by how the sale choices are consistent with the available pigs.

## DMRI Pork Pricing – optimal product mix

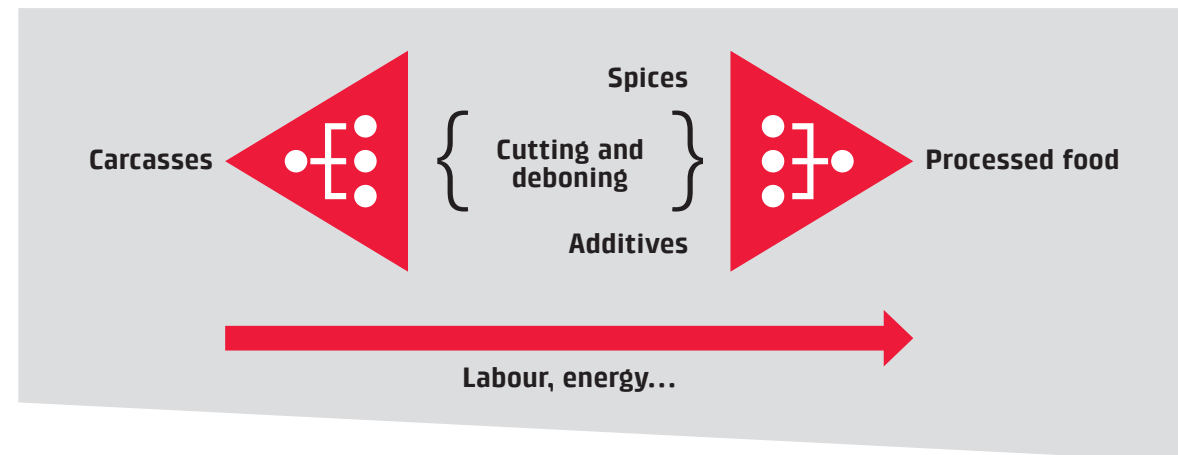
It all starts with the market and the company's strategic sales plan. In a globalised world, a pork meat industry has almost endless possibilities to commercialise its articles into a wide variety of formats. Nevertheless, no matter the product nor the format, it all starts with a number of pigs which will be slaughtered, cut and further processed. Namely, the company needs to choose how these pigs will be used to supply the targeted markets.

Thus, given a certain pig supply and cost structure, several questions arise: Which market is more profitable? Which is the optimal product mix within this market? Which sales channels or customers are the best? The key to answer these questions is on the determination of the 'break-even' prices, i.e., the prices at which the finished goods should be sold to cover the total costs.

The comparison between the market and break-even prices permits:

1. Sales profit forecasting.
2. Comparison of sales options.
3. Determination of sales prices.
4. Profitability by market, product mix, sales channel or customer.

The typical process in a meat industry implies both disaggregation and aggregation processes. The slaughtering, cutting and boning of the pigs being the first (a whole split in parts), and the further processing and packaging the second (the parts conforming a whole).



In the aggregation case, the determination of the break-even prices is a straightforward calculation where the cost of each raw or auxiliary material is added to the related manufacturing costs: labour, utilities, services, supplies, depreciation, overhead...

Nevertheless, in the disaggregation one, the starting point is the unique cost of purchasing the pigs where there is no single way to split it among the parts. Therefore, the utilization of consistent standardized cutting tests and the adoption of coherent hypothesis and criteria are needed.

The **DMRI Pork Pricing** service and tool provide a comprehensive insight into these criteria and the proper flexible data structure to cope with the complexity of the different cutting and processing recipes, the different operative costs and the calculation of the break-even prices from the reference purchase price for the pigs. The software module, which naturally integrates into the company's ERP, includes a powerful BI tool to visualize and analyse the results.

The intrinsic relation between these three elements – pork population, available products and markets and profit – bring three central questions for every company:



- Given my pigs, does my product mix at the market maximise the profit?
- Given my market demands, do my pigs maximise the profit?
- Given my pigs and the market, does the carcass utilisation maximise the profit?

The DMRI can assist you answering the three questions with a suite of three new services and specialised software modules that conform the **DMRI Pork Profit®**.

## DMRI Pig Purchasing – optimal pig supply

Whether a pork meat industry produces their own pigs or purchases them at the market, the available carcass online measurement systems offer a powerful tool to drive the population to the highest value in accordance with the targeted markets.



Given certain market conditions (products, specifications, volumes and prices), the Yield Models enlighten about how the different variables in the pig population affect the margin. In other words, they objectively inform about how the pigs are suited to produce the final articles.

This knowledge can be transformed into a set of payment criteria that reward those traits in the pig supply that promotes the profit, creating a mutually beneficial relationship with the farmers.

The **DMRI Pig Purchasing** service transforms the developed Yield Model equations into a comprehensive and tailor-made set of payment criteria. These parameters are introduced into the flexible software module, which gathers the needed information and measurements from the

traceability system and calculates the payment per batch. Once again, the software includes a powerful BI tool to effectively provide the suppliers with the proper feedback and benchmarking.



## Yield Models – the value in the diversity

All pigs are different, but how much does a certain pig yield? And, why does it matter? A 'Yield Model' consists of a set of equations that relates the company's margin to the measured variables for a certain type of pig and range of products and specifications. In other words, these equations connect the expected profitability with the natural variation of the pigs by means of objective measurements.

The involved variables can be several and of different nature:

1. Category variables: breed, provenance, animal welfare status, gender...
2. Quantitative variables: carcass weight, meat content, fat thickness, primal weights...
3. Qualitative variables: colour, PSE, marbling, muscle composition, boar taint...

These Yield Models, as it will be seen in the next paragraphs, are the backbone of the **DMRI Pork Profit®** services and software. To develop these equations, a number of cutting tests are carried out in close cooperation with the company's key staff under the supervision of the DMRI's expert butchers over a representative population of pigs.

## DMRI Pork Sorting – optimal carcass utilisation

The sales are closed, the pig supply scheduled, and the production plan for the cutting and deboning is set. The next question is, how the pigs in the equalisation room will be used to produce the different products?



Once again, the answer is in the Yield Models. The available population of pigs, the Yield Model equations, the production planning and the restrictions imposed by the quality specifications conform a Mixed-Integer Programming problem where the profit is the variable to be maximized.

The **DMRI Pork Sorting** service and software resolve this optimisation problem for any given population, providing a powerful simulation tool to explore the different possibilities and have a clear insight into the optimal sorting criteria. These optimal solutions need to be transformed into specific sorting criteria that cope with the real-life limitations (number of sorting groups that can be handled in practice).

The software module, in communication with the MES level, is fed with the dynamic sorting criteria to create the different groups of carcasses, which will be connected to the existing production planning to define how each group will be used to produce the different articles.

