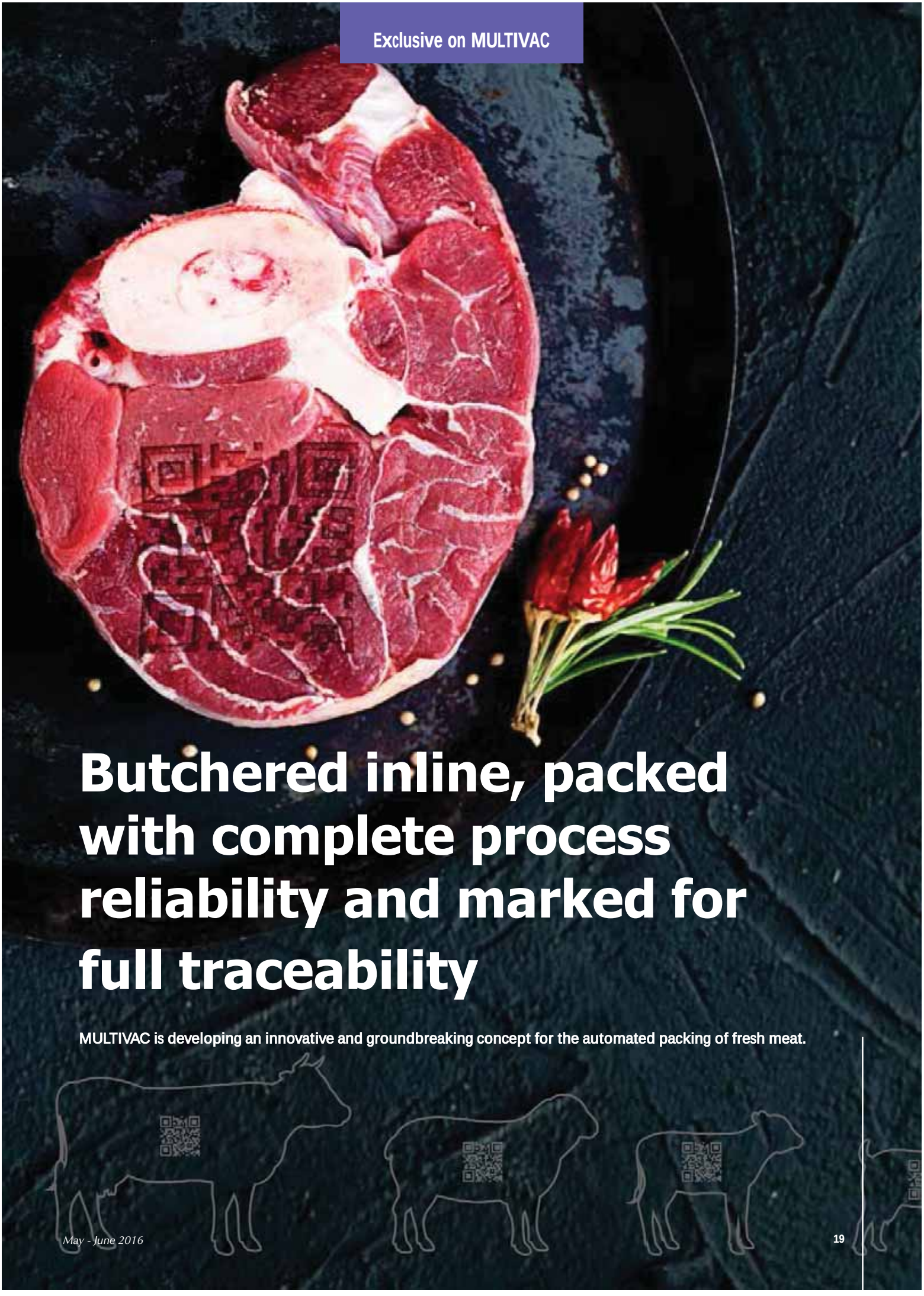

Butchered inline, packed with complete process reliability and marked for full traceability

MULTIVAC is developing an innovative and groundbreaking concept for the automated packing of fresh meat.

This concept features the use of an efficient thermoforming packaging process and a track-and-trace solution for traceability at the individual pack level. According to estimates by the FAO, worldwide meat production reached around 319 million tons1 in 2015. The largest producers were China, the European Union, the USA and Brazil. In the EU more than 44 million tons of meat are produced annually, around half of which is accounted for by pork[2].

Efficient and flexible processing, i.e. the butchering and packing of fresh meat, plays an important role for many meat-processing companies. For many producers the traceability of meat products over the entire added value chain is gaining in importance in maintaining food safety and consumer confidence. Since the new Food Information.

Regulations, which came into effect in December 2014 across the EU, the information requirements have increased still further, e.g. to include details of the food's country of origin. Since April 2015 it is mandatory for unprocessed, prepacked pork, lamb, goat's meat and poultry to be marked with information about where the animal was raised and slaughtered. Up to now this regulation only applied to unprocessed beef[3].

In order to meet such requirements, MULTIVAC has developed a new concept for fresh meat packing, which features partially automated product infeed, an efficient thermoforming packaging process and the seamless traceability of the products.

Automatic thermoforming packaging as an alternative to packing in film pouches Freshly butchered beef, veal or pork is usually packed in thermoformed packs or shrink bags. Both these packaging procedures have proved to be very successful in most cases. However, thermoforming packaging solutions are better than bag packing systems in meeting some requirements for inline packing of freshly butchered primal cuts, such as high-output process automation or easier handling when manually fi lling the packs.

FormShrink® shrink packs as another option, a fresh meat line can be equipped with MULTIVAC packaging machines for producing FormShrink® shrink packs. With FormShrink® each product is provided with individually customised packaging, regardless of its size and shape. Special FormShrink® films are required, which are characterised by their particular barrier properties, high level of puncture resistance and outstanding overall stability. Their shrink properties are activated in a shrinking unit. The interaction between the thermoforming packaging machine and the packaging materials enables shrink packs to be produced in large volumes with automated process reliability. MULTIVAC has decades of experience in shrink packing. One result of this is the unique chain guide for the upper web, which is recommended for FormShrink® packaging solutions. It guides the film so precisely, that the particularly thin and puncture- resistant packaging materials can be run reliably and without creases.

With thermoforming packaging solutions, the user can achieve a high output, economical consumption of packaging materials and a greater degree of automation, while at the same time saving on personnel.

When used in fresh meat processing, thermoforming packaging solutions offer several benefi ts: the completely open pack cavities can be fi lled quickly and cleanly from above, and this process stage can therefore be automated easily. Loading grids ensure that the seal fl anges are not contaminated during this process. This means perfect and permanent seal seams are produced during the subsequent sealing process, and this increases pack security during the entire logistics chain. The packs can also be equipped with an easy-open corner, which enables the pack to be opened easily and in a controlled manner.

New development: Thermoforming packaging line with traceability marking at the individual pack level MULTIVAC has developed a partially automated thermoforming packaging line, which is specially designed for the requirements of meat-processing companies and is connected directly to the butchering line. In the case of beef butchering, up to 30 packs per minute can be produced in the required pack size depending on the primal cut. The output with pork butchering is correspondingly higher.

Since this is a largely automated process, a high output can be achieved with the minimum use of personnel.

Traceability of food

In addition to this, the line is equipped with highly modern track-and-trace technology, which documents the entire product flow and enables each item to be tracked seamlessly from the identification of the slaughtered animal to the finished meat pack. Thanks to the linked ERP system and corresponding database information, it is possible to trace every item to the individual animal level.

The hygienic design of the line and its high-quality modules, such as the smooth-body motors used, enable it to be cleaned quickly and reliably, which is essential for the food hygiene required in meat processing.

Intelligent line arrangement and process reliability

The infeed unit for the primal cuts is single-track and connects directly to the butchering lines. The individual primal cuts are first transferred manually from the butchering conveyor to the identification conveyor of the packaging line, where they are identified by means of a product matrix on the user interface. The associated batch information from the ERP system is linked in at the same time, and the primal cuts are weighed dynamically. The label for the primal cut is subsequently printed with the information from the ERP database (item designation, weight, batch, etc.) and with a unique batch ID for this primal cut in the form of a 2D code. This food-safe label is applied manually to the primal cut and remains on the product during the subsequent packaging procedure. An operator at the user interface gives the final release of the product for transport to the downstream packaging lines.

Depending on their allocation in the higher-level ERP system, the primal cuts are fed automatically to one of the two packaging machines that are arranged in parallel. Different pack formats are produced on each of these machines, and the sizes of the formats are designed to ideally suit the allocated primal cuts. The sequence and number of required pack sizes on each machine are proportional to the primal cuts that are currently being fed in, and this is controlled "on the fly" by the line-motion data, which activates the appropriate thermoforming dies to create the required pack cavities. The allocation of the products to the particular lines and their different formats, i.e. pack sizes, is stored in the ERP system according to the operational butchering method, and it can be adjusted at any time to suit the cutting specification based on the planned butchering.

Another benefit: Since each primal cut is individually FOCUS weighed and tagged with an individual label, it is possible to use this feature for additional functions within the internal company logistics. This data can also be used without any additional effort for diagnostically evaluating butchering methods and the slaughtered animal.

When they arrive at the loading area of the thermoforming packaging machine, the primal cuts are placed into the pack cavities with the label facing upwards. No specified sequence has to be observed, since the batch ID on each pack is scanned in directly before it enters the sealing station. This enables the "Actual content" to be adopted in the line-motion control of the packaging machine.

The label with the unique batch ID, which remains permanently on the primal cut, also enables packs to be repacked after opening, for example after quality testing or leak testing has been carried out.

The batch information is retrieved after the sealing station from the batch IDs stored in the line-motion control, and this is used to print the outer label for the packs.

This information is transferred at the labelling station to a print layout with variable fields, and each label is then printed in batch size 1 and applied reliably to the corresponding pack without any risk of confusion. The batch data can be used individually, for example for optional product attributes or data on provenance. This is performed by the customer and controlled via the particular print layout. This also applies to the printing of quality or test seals that are assigned by the batch ID.

Thanks to the reliable packing and traceability marking of primal cuts via an ERP system, the packaging line also fulfils the requirements of Bio Associations, which often go far beyond the requirements of EU law[4].

1. Source: FAO, http://www.fao.org/3/a-I5003E.pdf
2. Source: http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Meat_production,_by_species,_EU-28,_2009-2013_new.png
3. Cf. Regulation (EU) No. 1169/2011 concerning information about food for consumers
4. Cf. EC Eco Regulation. ◆