



# COMPLETE PACKAGING LINES FOR MEAT AND POULTRY

Everything you need to know about processing and packaging meat and poultry in all kinds of packaging and packaging materials on the proper packaging lines.

 **JASA**  
PACKAGING SOLUTIONS

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# PREFACE

This e-book has been prepared to provide insight into the processing and packaging of meat and poultry. To compile this book, the experiences of customers and suppliers have been combined. All suggestions in this e-book are intended as guidelines and not as definitive solutions. To find the best solution for your product, we advise you to contact one of the experienced advisors of JASA Packaging Solutions.

(No rights can be derived from any advice described in this e-book.)

# 1. Meat and poultry



Worldwide the demand for meat and poultry is rising. Compared to 50 years ago, more than three times as much meat is produced worldwide today. With an annual production of about 13.4 million tons, the European Union is one of the largest poultry producers in the world. The Netherlands is a major player in the field of meat and poultry. In 2020, the Netherlands exported 8.8 billion euros worth of meat. This made the country the largest exporter of meat within the European Union.

Before all that meat and poultry is hygienically packaged and delivered to the consumer, the restaurant, or other target groups, the product has already traveled quite a distance through machines, weighers, and past robots. Hygiene is crucial when packaging meat and poultry requiring an appropriate packaging process and suitable packaging. The packaging of meat and poultry plays a significant role in:

- | Extending shelf life
- | Guaranteeing quality
- | Giving the product an attractive consumer appeal

JASA Packaging Solutions is an expert in designing and building complete packaging lines for meat and poultry. This e-book explains the packaging process for these products and the selection process to choose the right packaging line.

# 1.1 High-quality packaging lines and trends

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Meat and poultry are products that must be packaged in a hygienic environment to ensure consumer safety. This requires the right packaging, the right packaging line, and the right packaging process.

In addition, it is essential in the meat and poultry industry to keep up with the trends in packaging formats and materials. In recent years, the demand for sustainable packaging has increased, for example, packaging with less packaging material while using recyclable materials.

Next to that, a noticeable trend for retailers is to pack luxury meats in thermoformed packaging or a tray with a top seal, with a stylish cardboard sleeve around it. The industry also continues to innovate, continuously pursuing new packaging solutions for meat and poultry.

In addition to taking the consumer's wishes into account, a packaging line must be created that meets the producer's wishes in terms of quality, speed, and flexibility. JASA is increasingly facing the demand for automation and robotization, allowing meat and poultry to be packaged fully automatically, without persons touching the product during the entire packaging process. This saves man-hours and contributes to the hygiene of the entire packaging process.



## 1.2 Packaging as a marketing tool

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Given the high level of competition in the meat and poultry market, packaging can be used as a marketing tool to appeal to consumers. The cardboard sleeves of the JASA Sleever are well suited for this purpose. The sleeve can be used to create a suitable packaging design, which makes the sleeves the perfect way to brand products, thus creating a recognizable product on the shelf. Sleeves offer space for product information, barcodes, and extras such as preparation methods, recipes, and quality ratings.

The sleeves offer great printing possibilities, higher resolutions, and lots of flexibility. Even the inner side can be printed, ensuring that the product will stand out on the shelf.



Figure 1. Meat with sleeve packaging.

Branding can also be applied in vertical packaging by opting for a full-color printed bag. This can be offered in different packaging styles, such as a pillow bag, doypack, or side gusset bags.



Doypack



Pillowbag



Side gusset



Quatro pack



Block-bottom

Figure 2. Packaging styles.



## 2. The packaging process



The choice of a packaging line has a significant impact on a company. With the proper packaging line, a company can save time and man-hours. The ROI on a packaging line is easy to calculate and will soon be profitable with today's high-speed machines. By selecting a flexible packaging line that can easily be changed in terms of packaging size and materials, your packaging company is prepared for the future.

A complete weighing and packaging line includes infeed of the products, transport to the weighing and filling stations, and finally, the sealing of the packaging, be it robotized or otherwise. For meat and poultry, upstream and downstream systems can be integrated into existing packaging lines. The packaging lines can be fully automated, thereby offering various proven modular solutions for meat and poultry.

A high-quality packaging line offering flexibility, hygiene, and speed is required when packaging meat and poultry products. Horizontal and vertical packaging solutions are possible for meat and poultry. Filling trays with meatballs and sleeving packs with steak tips is done on a horizontal packaging line, packing bags of frozen chicken nuggets is performed on a vertical packaging line.

At JASA, we build customer-specific packaging lines and keep their maintenance in-house to ensure the best product and service. The systems JASA works with can be integrated into existing installations and synchronized with upstream and downstream equipment.

## 2.1 Components of a packaging line

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Meat and poultry are transported in refrigerated packages to the packaging line, which can consist of various components as required for the product. Depending on the product, volume, packaging, and customer requirements, we can identify the following components of a packaging line for meat or poultry.



Figure 3. Meat types.

### **De-nesting**

With tray or bowl packaging, a de-nester is added to the packaging line to de-nest the trays at high speed and place them into the filling station. An important feature is that the tray must be designed for de-nestability. This is one of the reasons why a specialist should be involved in the early stages of the design process of a packaging line.

### **Weighing**

For meat and poultry, carousel weighers and linear multi-head weighers are used.

A multi-head weigher sets a target weight based on multiple partial weights. For example, 14 heads are available, from which the four closest in terms of

target weight are chosen. The minimum weight is, of course, always guaranteed.

Generally, the weight chosen for a package of meat or poultry is between 250 grams and 15 kilograms. When selecting the weight, it is essential to look to the future. For example, 250 grams might be packed now, but this might become 1500 grams in the future. The packaging line can be set up for this so that a different weight can be packed with the same line. In all cases, every portion is weighed accurately and with minimal deviation

The choice of weigher depends on the weight to be produced and the desired capacity. Different products may also require different weighers. It is essential to consider the weigher's requirements and choose a version that ensures that the product is processed hygienically throughout the system.

## Top sealing or thermoforming

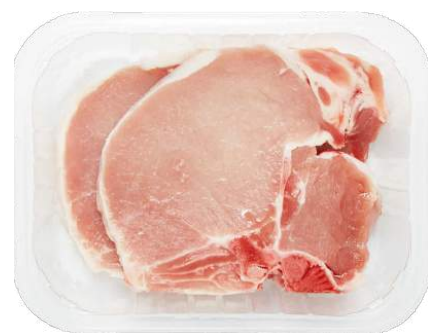
Nowadays, the most common choice in tray packaging is to seal the package by applying a top seal film. This film can be resealable or feature a peel-off window. Alternatively, it is possible to opt for a skin pack, which molds itself entirely to the product.



Thermoforming



Skinpack



Top seal

Figure 4. Packaging styles.

## Vertical packaging machine

A vertical packaging machine, also called a vertical forming, filling, and sealing machine, automatically bags frozen products. The bag shape is formed from a flat roll of film. This film can be either printed or unprinted. When the product is poured into the bag from the weigher, the bag is already formed and then closed by sealing it.

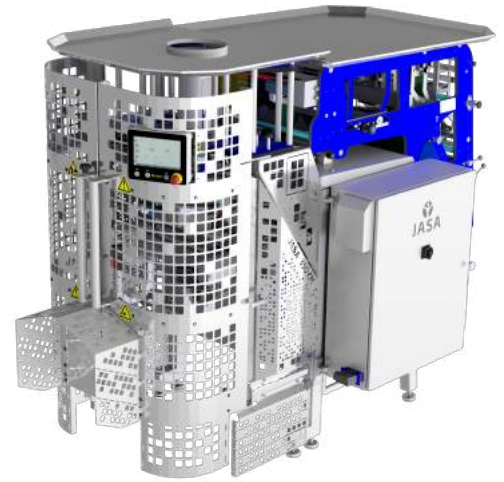


Figure 5. JASA vertical packaging machine.

## Metal detection, x-ray & checkweigher

Metal detection equipment is used to detect the smallest metals; x-ray systems can detect metal, glass, defective products, plastic, a snapped blade, and many other materials; a check-weigher checks the weight of all products.

A combination of these systems is often chosen, for example, metal detection and a check-weigher or the combination of an x-ray and a check-weigher.

## Outfeed conveyor

The JASA outfeed conveyor is an add-on to JASA machines and can be easily connected to all JASA machines. The output belt is available in 3 different belt widths. The height of the conveyor is also adjustable, which minimizes the drop height of the product. Other features of this output conveyor are:

- | Low noise level
- | Hygienic, high care design





Figure 6. JASA outfeedbelt.

## Conveyor Belt Systems

Conveyor belt systems are the connecting link between the individual processing stages in the packaging line. All conveyor systems supplied by JASA are designed for their specific application. JASA's conveyor belt systems are maintenance-friendly and ergonomically designed. In addition to the various industry standards, JASA also offers customized solutions.

The plastic materials used for the conveyor systems are suitable for foodstuffs, such as meat and poultry.

## Platform

JASA platforms are constructed from box sections and may or may not be equipped with floor plates, stairs, and safety handrails. These platforms are designed to absorb static and dynamic loads from, for example, weighing machines. They also provide optimal and safe access for operation, maintenance and cleaning. The platforms are equipped with brace structures and feature height-adjustable stands.

JASA offers a range of platforms for dry and wet environments:

- | QC range in dry environment painted carbon steel structures
- | QB assortment moist environment stainless steel structure
- | QA assortment hygienic environment stainless steel structure

These platforms are particularly suitable for meat and poultry packaging lines due to their ease of cleaning. The QA range platforms are built according to the EHEDG (European Hygienic Engineering and Design Group) guidelines.

The QB and QA platforms can be equipped with a cleaning wall for the wet cleaning of weighing and buffer bins. Cleaning is done with a high-pressure water jet whereby the cleaning wall prevents that water is blown into the facility. The platform floor is equipped with a gutter that collects and discharges the water from the platform.



Figure 7. JASA cleaning wall

## Case packing and palletizing

At the end of the line, a case erector folds the box, after which a case sealer tapes the bottom of the box, and a robotic arm picks up the package and puts it in the box. This process is fully automated. Once the box is filled, it is sealed then a palletizer places the box on a pallet.



## **Beckhoff control**

JASA works with the Beckhoff control technology. Beckhoff has one software environment instead of, for example, separate PLC software, display software, and servo drive software. Partly because of this, there are possibilities for 'camming & gearing.' This means that movements flow into each other instead of the separate servo movements. This results in shorter cycle times and, therefore, even faster machines.

## **Modified Atmosphere Packaging (MAP)**

A packaging can contain more than just meat or poultry. Modified Atmosphere Packaging (MAP) involves packing the product under a protective atmosphere whereby gas is injected into the packaging. This is a proven effective way to extend the shelf life of products. Typically, MAP uses one of three gases: carbon dioxide, nitrogen, and oxygen. It is, however, possible to use other gases. MAP can extend the shelf life of some products. Depending on the application, product technologists will determine if and which gas mix is best suited.

## **Vacuumizing**

Vacuumizing fresh meat will increase the shelf life. If required, JASA can vacuumize on vertical packaging machines. This is especially interesting for large packages used in the catering industry.

## 2.2 Tray lines

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See Figure 8 as an example of a complete tray line. This is a basic layout with dimensions of 19m (length) by 3.9m (width) by 4.7m (height). Depending on the space in which the line will be placed and considering all the specifications of the line, it will be tailored to the available space.



Figure 8. Example of a complete tray line.

## 2.3 Bagging line

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See Figure 9 as an example of a vertical packaging line. This is a basic design with dimensions of 10m (length) by 4.4m (width) by 5.9m (height). Depending on the space where the line will be placed and all the requirements regarding the line, it will be adapted to the available space.



Figure 9. Example of a vertical packaging line.

# 3. Meat & poultry and their packaging



Meat and poultry can be packaged fresh, frozen, or processed.

Packaging varies by target group:

- | Wholesale
- | Retail
- | Bulk sale

## Wholesale

Primarily used for wholesale are:

- | Bag packaging
- | Large packaging
- | Vacuum packaging
- | Deep frozen products

## Retail

Voor retail wordt veelal gebruik gemaakt van:

- | Skin packs
- | Smaller packaging
- | Fresh produce
- | Trays with top seals
- | Ready to eat packaging
- | Packaging with sleeves

## Bulk sale

For bulk sale, we mainly use:

- | Bag packaging
- | Large packaging
- | Vacuum packaging
- | Deep frozen products

## 3.1 Types of meat and poultry

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Fresh meatballs, frozen chicken nuggets, sirloin steak. Meat and poultry come in all shapes and sizes. Those different types require different packaging types, sizes, materials, and packaging lines.



Figure 10. Types of meat and poultry.



## 3.2 Packaging types and sizes

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There are four different packaging types for meat and poultry, all of which are suitable for possible printing, a sleeve or a label:

### 1. | Bag packaging

This packaging is suitable for vacuumizing and packing frozen products. Also, large packages are possible, which are ideal for the catering industry.



Figure 11. JASA bag packaging

### 2. | Top seal tray

This tray packaging is sealed with a top seal. The contents of the packaging ranges from 85 to 1000 grams and is suitable for combining with a sleeve.

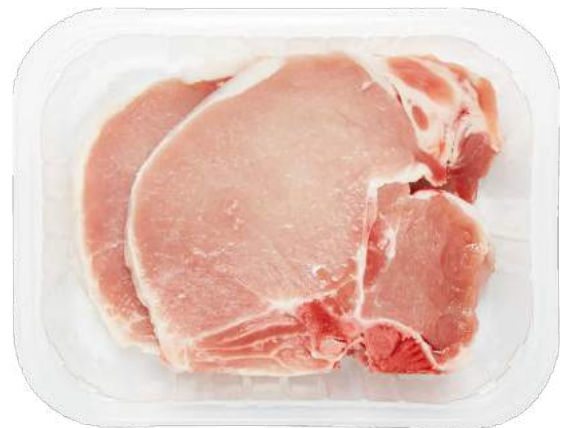


Figure 12. JASA top seal tray

### 3. | Thermoformed packaging

Thermoformed packaging consists of a bottom film and a top film. The film is formed in the forming mold through vacuumizing or compressed air. This makes the packaging suitable for packaging products vacuumized or gas flushed.



Figure 13. JASA thermoformed packaging



## 4. | Skinpack

In this process, the product is completely vacuumized and wrapped in the packaging, causing the packaging to take the product's shape.



Figure 14. JASA skinpack

## 3.3 (Sustainable) packaging materials

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When choosing (sustainable) packaging materials, three factors play a role:

1. | Type of packaging
2. | Thinner films
3. | Mono-material

All common sizes and films (including biodegradables) are possible on the JASA packaging lines; up to 100 packages are packed per minute depending on the packaging.

### 3.3.1 Type of packaging

After deciding on the appropriate packaging, we seek out the best-suited packaging material. This goes hand in hand, as the type of packaging is the first and easiest step to save material and thus keep costs low and use the most sustainable packaging possible. For bag packaging, thermoformed packaging, and top seal trays, less and less plastic is being used in packaging.

When choosing the proper packaging, among other things, consideration is given to:

- | The design of the packaging and whether it is easy to process automatically, for instance, the de-nestability of trays
- | Use of printed or unprinted film
- | Whether or not to add a label or sleeve

Due to the market's current (sustainability) developments, a top seal is often chosen when packaging in a tray. Compared to a tray with a lid, this saves up to 40% material. Bag packaging is also on the rise; this packaging consumes the

least material. Also, the production of the bag packaging is simpler and achieved at a lower cost, while the appearance with the right printing is also very stylish, and bag packaging can be performed at high speed. Bag packaging is highly suitable for packaging frozen meat and poultry, such as meatballs and chicken nuggets.

### **3.3.2 Thinner films**

The use of plastic can be reduced by packaging with thinner films. Thinner films retain the advantages of plastic packaging but reduce the amount of plastic. However, the packaging line must be optimally equipped to handle the thinner films. This can be achieved by optimizing the sealing systems, filling methods, and film throughput.

### **3.3.3 Mono-materiaal**

Mono-materials are increasingly used, as they are more suitable for recycling. Complex composite films consist of multiple types of plastics and can therefore not be recycled efficiently. Mono materials, on the other hand, are well suited for recycling.

In other words, plastic packaging materials can be used very sustainably. Plastic does not always have the best name, but it offers other significant (sustainable) advantages in addition to the points mentioned:

- | Hygiene
- | Long shelf life
- | Less food waste

# 4. Safety & hygiene



When it comes to hygiene and food safety, strict laws and regulations impose high requirements on food packaging. For this reason, packaging systems must be made of stainless steel and have a hygienic design that is quick and easy to clean.

To comply with hygiene and safety regulations, clean and safe packaging must be guaranteed. Hygiene is an absolute prerequisite to ensuring consumer safety.

The packaging line is constructed to make maintenance, cleaning, and disinfection as easy and efficient as possible. The various components of the packaging line, such as the platforms, are designed to prevent the accumulation of dirt and the formation of unwanted mold.

The adherence to strict hygiene and safety regulations does not imply a decrease in the flexibility and speed of the packaging line.

JASA ensures hygiene by:

- | Making the machines from stainless steel, which is easy to clean
- | Vacuumizing the bags, a process that sucks out a lot of moisture. JASA utilizes a system whereby the lances are rinsed without having to spend man-hours on it
- | Using a cleaning wall for weighing containers with central wastewater discharge
- | In the packaging lines and machines, there are no inclusions or dead spaces

Employee safety is also ensured, among other things, by an emergency stop for the entire line. A knob that brings the whole line to a halt at the push of a button.

# 5. Roadmap to find the right packaging line

To put together a good packaging line, it will help to give answers to the following questions:

- What is the type of product?
- What is the desired packaging type?
- What is the total output?
- What is the desired weight per packaging
- What is the composition of the end product
- How many packs/total weight of each SKU per day/week
- Additional desired options such as:
  - MAP
  - Vacuumizing
  - Add labels/print on packaging
- Wishes for future expansion
- The layout of packaging area → dimensions to be taken into account

# 6. Conclusion



Food safety is essential in the packaging of meat and poultry. Hygiene can be ensured in several ways, including choices of machinery and the design of the packaging line.

JASA offers the ideal packaging solution for meat and poultry. JASA is known for its turnkey solutions, quality, and service. JASA has more than 35 years of experience in packaging lines for trays and bags. We pay attention to the customer's wishes and advise on the best machines and materials while considering the future.

JASA is known for its top-quality machines and components and can put together a fully automated and flexible packaging line according to the wishes of our customers. The area in which the packaging line will be installed is also taken into account; a JASA packaging line can smoothly run in an area with obstacles or a low roof.

With its innovative packaging solutions, JASA is a frontrunner and market leader in the packaging industry. JASA offers high-quality meat and poultry packaging lines featuring sustainable packaging using less plastic while providing flexible, high-speed packaging.





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