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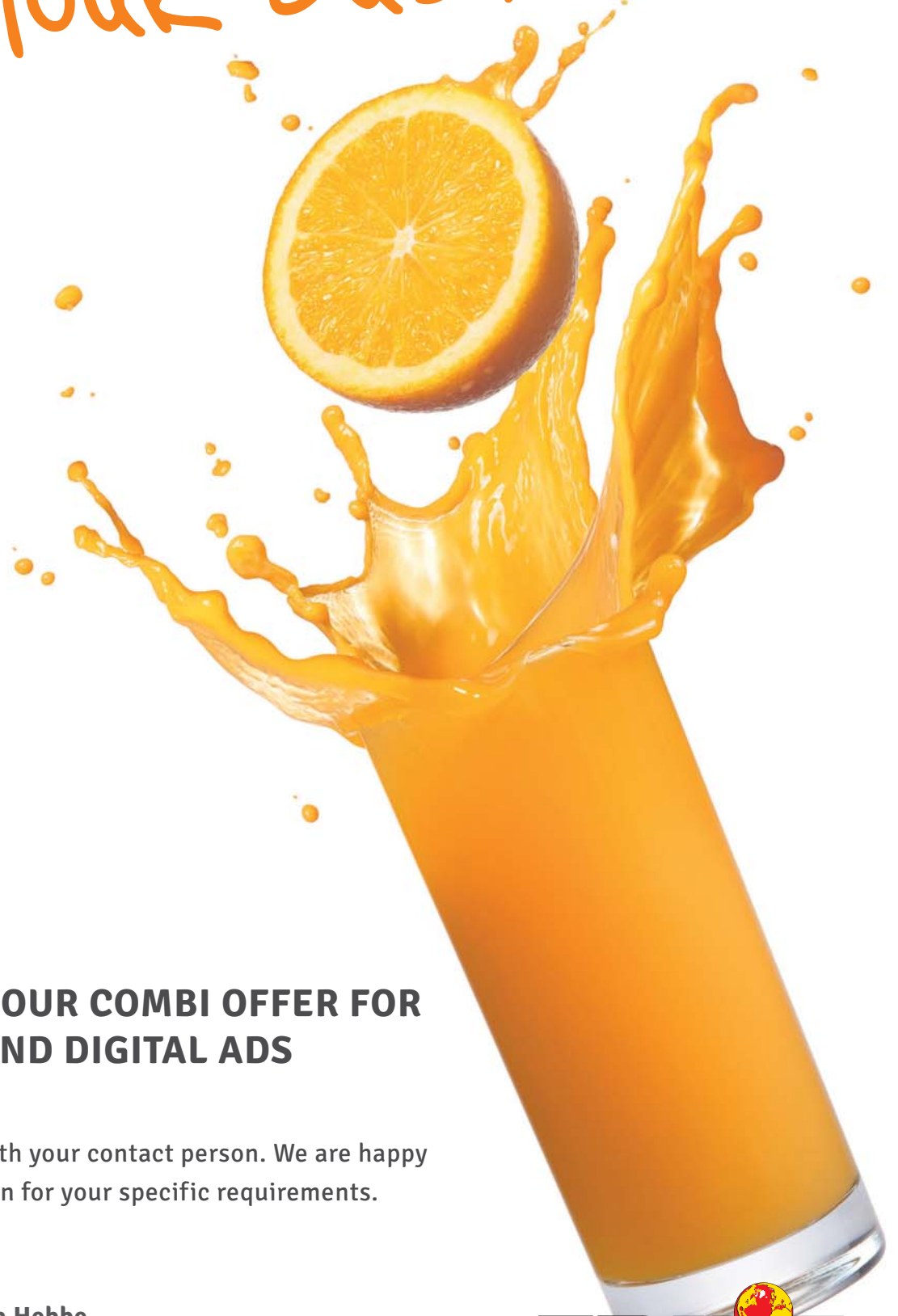
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**FRUIT**  
PROCESSING

*Dear Readers,*

In the January/February issue of FRUIT PROCESSING we introduced a new method of citrus forecast in Brazil which presents the methodology and results of the first study of the citrus tree inventory and the orange crop forecast. The PES (Production Forecast Research) puts an end to a decades-long history of publication of conflicting data about the number of productive trees in the citrus belt and the estimated total orange production and forecast. “What to expect from the Brazilian orange production for the 2016-2017 season” – please find the latest results out of the second study on page 138.

A preventive maintenance strategy makes maintenance easier to plan; service lives and thus production times can be lengthened and the number of unplanned downtimes is reduced. This in turn boosts the availability of the line which is reflected in the Overall Equipment Effectiveness (OEE). A cut in costs for maintenance can also be achieved. Bavaria N.V. has already been able to increase its OEE by 27 % and at the same time reduce its maintenance costs by EUR 16,000 per machine and year. Please read more about choosing the right maintenance strategy on page 142.

A new Hygienic Dispenser allows for easy and gentle filling of fruit pastes and purees, and even smoothies, into a variety of packaging sizes. The valuable ingredients remain in the fruit pastes, vitamins and fruit pieces, and are neither “squashed“ nor destroyed under high pressures. Even large fruit and vegetable chunks can be easily filled. Please learn more about transferring the proven endless piston principle of large pumping systems into modern and innovative dispensing systems on page 147.

Augmented reality (AR) opens up a new dimension of on-pack marketing. The technology provides a bridge between physical objects and the digital world in real-time and offers scope for a whole range of creative marketing ideas and campaigns that will engage and delight consumers. Carton packs become an interactive experience. Enjoy reading as of page 151!

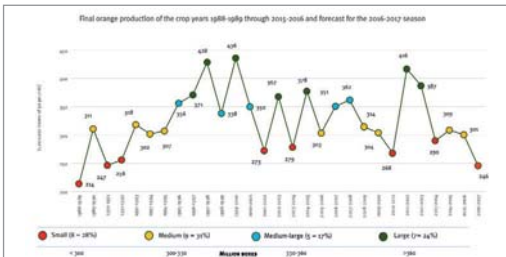
Yours,



*M. Breich*

### SUPPLYING MARKET

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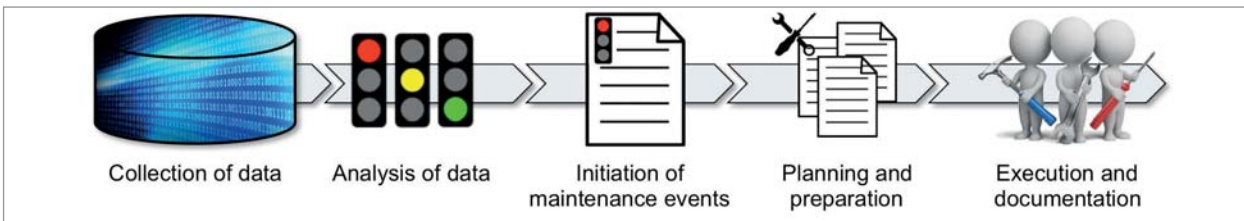


As described in the January/February issue of Fruit Processing (Neves et al, 2016), the PES (Production Forecast Research) is a nice example that the Brazilian orange juice supply chain gives to the country and to the world. This project puts an end to a decades-long history of publication of conflicting data about the number of productive trees in the citrus belt and the estimated total orange production and forecast...

### PREVENTIVE MAINTENANCE

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Industry 4.0, the smart factory, the Internet of Things and cyber-physical systems are watchwords which – among other things – describe a constant rise in the level of digitization in the production process. However, in many cases it is not necessary to further fit machines with sensors and actuators as the machine is already capable of supplying data. All that is often lacking is a suitable connection and knowledge of how to usefully analyze and understand the available data...



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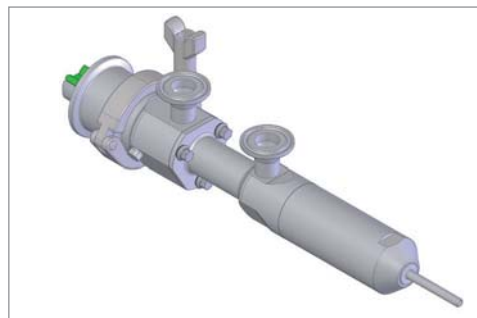
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**FILLING & DOSING**

*Wolfgang Merklein*

**Hygienic Dispenser for fruit and vegetable pastes . . . . .147**

Liquid or paste products of a highly viscous nature with particles and bits in are still very sensitive when processed and filled. New, unprecedented product lines in the food industry show limits in existing production structures. For example: “individual food” - one of the major trends in the industry. This includes foods and beverages which are not available off the shelf and produced in large batches, but tailored to the consumers’ needs and produced on demand. “Personal food” contains favourite flavours and specific ingredients. Even “functional food” and “super foods” are on the market - these include custom smoothies with health-promoting properties or fitness bars tailored to each type of sport. For allergy sufferers, special food, which does not contain allergens, can be produced as if “home-made”. For each of these trends, new unconventional production methods are demanded, with the same level of standard of hygiene to be met. This is a real challenge for existing production lines...



**PACKAGING**

*Heike Thevis*

**Zappar magic: SIG Combibloc carton packs become an interactive experience. . . . .151**



Welcome to a new world! Augmented reality (AR) opens up a new dimension of on-pack marketing. Partnering with Zappar, one of the world’s leading developers and providers of AR, SIG Combibloc is turning carton packs into interactive and engaging experiences. The technology provides a bridge between physical objects and the digital world in real-time. All you need is a smartphone or tablet, the Zappar App and off you go: content is brought to life. The first SIG Combibloc carton packs with Zappar’s “zapcodes” are already on sale. The technology offers scope for a whole range of creative marketing ideas and campaigns – infotainment – that will engage and delight consumers...

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# What to expect from the Brazilian orange production for the 2016-2017 season

| Citrus Tree Inventory | Orange Crop | Orange Production Forecast |

## 1 Introduction

As described in the January/February issue of FRUIT PROCESSING (Neves et al, 2016), the PES (Production Forecast Research) is a nice example that the Brazilian orange juice supply chain gives to the country and to the world. This project puts an end to a decades-long history of publication of conflicting data about the number of productive trees in the citrus belt and the estimated total orange production and forecast.

It is in the second year, where we could dramatically improve in the learning curve, with fewer conflicts and negotiation situations that wore us down in the first year, the confidence among agents has grown (citrus growers more easily allowed the agents to enter to the groves), Fundecitrus was empowered, which should be our main organization in the citrus industry and involved two of the most important universities in Brazil (USP and UNESP).

Besides, PES is an example to the world of orange and fruit juice producers, being presented (the project and its method) at the Juice Summit (Antwerp, 2015) which gathers all the world's industry from the fruit processors to the packers of the consumer drinks (over 400 people) and was also presented to the USA's orange supply chain in Lake Alfred (Florida) in January this year, where scientists of the University of Florida and the USDA saw what is being done. The method was published in the International Agribusiness Congress (meeting in Minneapolis, 2015 and approved to be presented in June, 2016 in Aarhus - Denmark).

## 2 Objectives and Method

The objectives of this article are to show the major results of PES project to the Fruit Processing community.

The method was described by Neves et. al. (2016), where readers can get more information. This year we had our first crop forecast announcement for 2016-2017 at Fundecitrus (Araraquara, SP, Brazil) on May 10th. The following updates will be on 09/12/2016, 12/12/2016,

02/10/2017 and the final estimate of the season on 04/10/2017.

The project involved 127 researchers, covering over 476,000 km, a work that gathers not just Fundecitrus, but also Markestrat, FEA-RP/USP and UNESP. The next session explores the results.

## 3 Results: Orange Production Forecast for the 2016-2017 Season of the Brazilian Citrus Belt

The area of orange groves, including all varieties, is 416,843 hectares, 6.2 % smaller than compared to the 2015 inventory. The orange groves implemented in 2015, which added 9,583 hectares, were included in this year's inventory. The ones that were removed or abandoned totalled 37,465 hectares. We had a considerable reduction of 27,882 productive hectares between 2015 and 2016. This area probably migrated to sugar cane and other crops.

The abandoned groves of the most common varieties, which account for 97 % of the orange area, total 6,511 ha, contributing negatively to the health of the citrus belt. There are 175.55 million of bearing trees and 16.46 million non-bearing (considering 11.26 million of young groves and 5.2 million of resets trees). In total we have 192.01 million trees in the belt. Of those, 66.0 million (34.4 %) are over 10 years old, 73.8 million (38.4 %) are between 6 and 10 years old, 35.7 million (18.6 %) are between 3 and 5 years old and 16.46 million (8.6 %) are between 1 and 2 years old. Compared to last year, the bearing trees increased by 0.8 % and it caught our attention that the non-bearing ones (1 to 2 years old) fell by 30.6 %, which shows minor renovation in citrus industry.

Over 90 % of the citrus belt consists of four groups of varieties. Pera Rio with 34 % of the total orange trees, Valencia (including Folha Murcha) with 32.85 %, Hamlin (including Rubi and Westin) with 15.36 % and Natal with 10.73 %. The distribution by maturity stage of varieties shows that 39.06 million trees are early season varieties

(harvested between May and August), 66.62 million are mid-season (harvested between July and October) and 86.33 million are late season (harvested between October and January). The average density of young groves is 654 trees/hectare, maintaining the level of 600 trees/hectare reached since 2013. The average density of mature groves, in other words, the ones implemented before 2014, is 467 trees/hectare, an increase by 4.24 % compared to the previous inventory. The older groves have lower average density (groves more than 10 years old have an average of 392 trees/hectare).

The average age of mature groves is 9.8 years old, which shows a relatively young park. However, 35,566 hectares or 9 % of bearing trees are 20 years old or more. The average density of this portion of groves is 336 trees/hectare. The young groves reached 781 trees/hectare (in Altinópolis region).

From the total of 7,558 orange groves, 5,542 groves or 71.72 % have less than 10 thousand trees, and it goes up to 82.93 % if you consider the groves which have up to 20 thousand trees. This 82.93 % of groves answer for 16.17 % of the total of trees in the park. Therefore, the remaining 1,295 groves, which have more than 20 thousand trees each one, are 17.07 % of the total of groves, but gather 83.83 % of trees. Around 314 groves own 60 % of the trees in the belt. The use of irrigation technology is present in almost 100 thousand hectares, around 25 % of the area.

The orange production forecast is 245.74 million boxes (90 pounds or 40.8 kg), as presented in the Table 1. The total includes 45.86 million boxes of Hamlin, Westin and Rubi varieties; 13.48 million of Valencia Americana, Valencia Argentina, Seleta and Pineapple; 70.38 million of Pera Rio variety; 84.48 million of Valencia and Valencia Folha Murcha varieties and 31.54 million of Natal variety.

The average productivity per tree was reduced by 19.1 %, to 1.40 boxes/tree, against 1.73 trees in the last crop. The productivity per area also dropped by 14.8 % (from 745 boxes/ha to 635 boxes/ha). We might have 22 more fruits per box (from 226 to 248) with an estimated rate of drop-page slightly lower (17.49 % to 15 %), see table 1.

The 2016-2017 orange production forecast is 18.26 % lower than the last crop (300.65) and the lowest of the last 28 years, as shown in the graph 1.

The hot and rainy climate is responsible for the differences because after the period, in which the growing fruits drop-page, there was frequent and above the historical average rain throughout the citrus belt, there weren't the necessary conditions for induction of significant new blooms. While in the previous crop 60 % of the fruits were from the



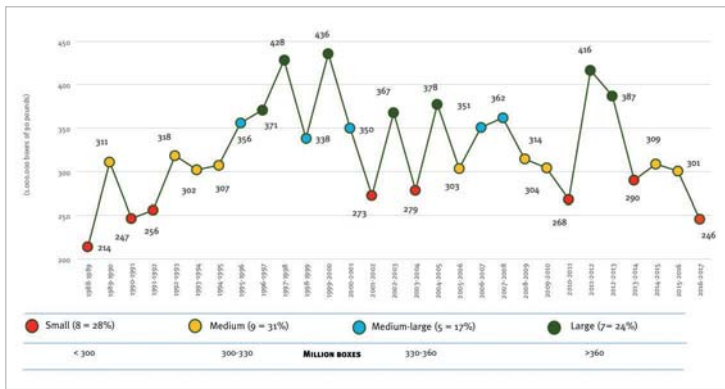
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Graph 1: Final orange production of the crop years 1988-1989 through 2015-2016 and Forecast for the 2016-2017 season

second bloom, this droppage leads us to estimate being almost 80 % of the first bloom.

Another fact is since the climate impacted the regions in different ways, the variation among regions increased because of the droppage, per example, the southwest region had 600 fruits per tree and in the northwest region, 268. Therefore, there are regions doing well and others doing bad.

#### 4 Final Comments

When looking at global OJ markets, we must realize that besides the numbers seen in Brazil and described at session three of our paper, some analysis should be done in Florida's situation. The USDA increased to 81.1 million boxes this season's Florida crops (2015-2016). It's a fact that the industry there will stop earlier, still in May, which generates even more inefficiency because it will increase industrial idleness as well as in other parts of the production chain. According to Browning (2015), most

growers stopped removing plants afflicted with Huanglongbing (HLB, also known as citrus greening). In 2015, it is estimated that 100 % of groves and at least 70 % of trees are infected. The prospects for the coming years are not good if there's no innovation in production.

The bets are on stocks below 300,000 t in Brazil, in the middle of the year. The tight supply might anticipate the contracts of European retailers and raise prices to a minimum floor of US\$ 2,100/t FCOJ in the next crop year. We might see even higher prices during the season.

As a conclusion on this May forecast for the orange production of the Brazilian Citrus Belt, we have millions less of seedlings being planted, reduced areas and lower renovation. Fruits per tree and their quality are a cyclical issue of productivity and, therefore, of production. Now, smaller area, fewer plants and less irrigation is a structural factor that undermines the future supply potential, turning into a lower potential. In other words, in a year where the scenario is good (climate and others) the production potential (because of structural damage) will be lower, which leads to believe that when we have super-crops, it will hardly reach 340 million boxes.

Finally, with a smaller crop in Brazil, smaller crop in Florida, even with the drop in demand (in April, there was a 5.8 % fall in consumption of juice once again in the USA compared to the same month last year, a monumental fall, considering the volume they consume) we will have a period where the supply will be lower than the demand, resulting in lower inventories and higher international prices of FCOJ and NFC, translated in higher prices of fruit boxes.

Table 1: Orange production estimate for the 2015-2016 and 2016-2017 seasons

Overview of orange production for the 2015-2016 and 2016-2017 seasons	Mature groves		Components of forecast				Orange production forecast		
	Area	Average density planting <sup>1</sup>	Bearing trees	Fruits per tree at stripping	Fruits forecasted by box <sup>2</sup>	Fruit loss from droppage forecast	By tree	By hectare	Total
	(hectares)	(trees/hectare)	(1,000,000 trees)	(number)	(number)	(percent)	(boxes/tree)	(boxes/hectare)	(1,000,000 boxes)
<b>2015-106 season: final orange production estimate (February forecast)</b>									
All varieties	403,492	448	174,126	498	226	17.49	1.73	745	300.65
<b>2016-107 season: orange production forecast by variety (May forecast)</b>									
Hamlin, Westin and Rubi.....	64,943	452	28,304	523	275	10	1.62	706	45.86
Other early season.....	18,317	464	8,256	475	245	11	1.63	736	13.48
Pera Rio.....	124,379	493	59,668	378	255	16	1.18	566	70.38
Valencia and Folha Murcha..	134,350	463	60,432	409	230	17	1.40	629	84.48
Natal.....	44,710	435	18,888	500	235	17	1.67	705	31.54
<b>Total/average</b>	<b>386,699</b>	<b>467</b>	<b>175,548</b>	<b>430</b>	<b>248</b>	<b>15</b>	<b>1.40</b>	<b>635</b>	<b>245.74</b>
<b>Change between seasons</b>									
Change.....	↓-4.2%	↓-4.2%	↑+0.8%	↓-13.7%	↑+22	↓-2.49%	↓-19.1%	↓-14.8%	↓-18.3%

(X) Not applicable.

1 Considers the total number of trees of the block, that is, bearing and non-bearing trees (2014 or 2015 resets).

2 Weighted average per stratum area.

The citrus grower who has fruits will have reasonable prices, which will help pay debts of previous periods of great sufferings. Like everything in life, it's not just the positive side, the problem is to know what will be the interference of these higher prices in an already weakened demand for orange juice. If bottlers will be able to pass this cost increase to the retailers is a triggering point, and if retailers will be able to reduce margins to keep



sales of orange juice is another intriguing point. The scenario changed dramatically.

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# KHS Product Division Packaging is continuously expanding its service portfolio and offers preventive maintenance

| Digital Enterprise | Industry 4.0 | Manufacturing | Preventive Maintenance | Virtual |

## Summary

Industry 4.0, the smart factory, the Internet of Things and cyber-physical systems are watchwords which – among other things – describe a constant rise in the level of digitization in the production process. However, in many cases it is not necessary to further fit machines with sensors and actuators as the machine is already capable of supplying data. All that is often lacking is a suitable connection and knowledge of how to usefully analyze and understand the available data. Together with its customer and partner Bavaria N.V. KHS GmbH has collected data from its machines and gained knowledge on maintenance in order that other customers can now also be assisted when optimizing their servicing procedures – right down to the provision of preventive maintenance.

## Introduction

On March 3 and 4, 2016, KHS GmbH held an in-house exhibition at its packaging machine production site in Kleve, Germany, under the motto of Innovation for U. Among the talks given by customers and partners the presentation held by Hans van Vijfeijken (global engineering and maintenance manager at Bavaria N.V.), entitled Packaging line of the future – preventive maintenance, awakened great interest. KHS GmbH has given Bavaria N.V. intensive support in the optimization of its maintenance processes for many years now. The results achieved thus far were outlined in the talk and the vision and objectives of the joint project explained.

The aim of the communal project is to replace the current time-based maintenance schedule with a program of preventive maintenance. Replacing a part at a fixed interval is then superseded by planned replacement close to the end of the part's life. To this end the part's condition must be monitored in order that its failure can be accurately predicted. All told, a preventive maintenance strategy makes maintenance easier to plan; service lives and thus production times can be lengthened and the number of unplanned downtimes is reduced. This in turn boosts the availability of the line which is reflected in the Overall Equipment Effectiveness (OEE). A cut in costs for maintenance can also be achieved. Bavaria N.V. has already been able to increase its OEE by 27 % and at the same time reduce its maintenance costs by € 16,000 per machine and year.

## Preventive maintenance

Choosing the right maintenance strategy has a major impact on the later cost of maintenance. KHS GmbH is already helping its customers with their maintenance programs by recommending a replacement interval for each spare and wear part. These replacement intervals have been empirically determined in countless field studies, already enabling customers to order the spare parts they require in good time. These spare and wear parts are stored at a central KHS warehouse so that here, too, clients can keep their own stocks to a minimum. However, even stipulating replacement intervals cannot ensure that a part is optimally exploited until the time comes for its exchange.

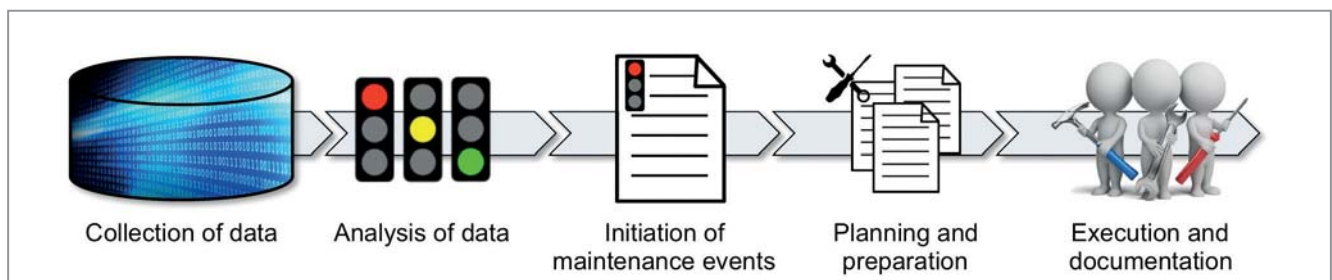


Fig. 1: Concept of preventive maintenance

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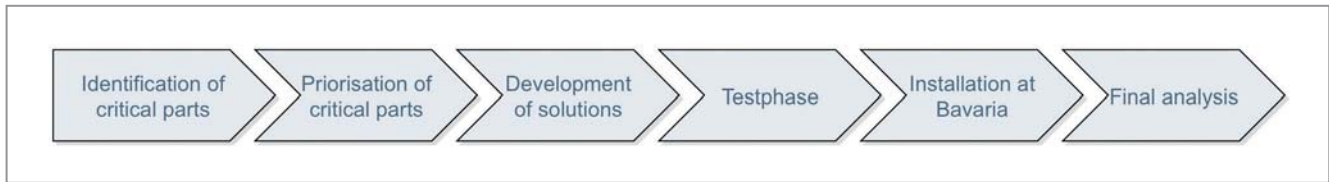


Fig. 2: implementation of the project

Preventive maintenance describes a strategy which enables a part to be used for as long as possible – while factoring in economic aspects and continuously monitoring the state of the part – before it is replaced shortly before the end of its life. Maintenance activities are planned so as to enable as many measures as possible to be combined to prevent long downtimes. In this process the wear-and-tear contingency must be known and information must be available on the replacement of the part (fig. 1).

An increasing level of digitization, also in production, means that it is becoming much easier to access data generated during the production process and required for monitoring the condition of parts and components. Packaging machines in particular yield a multitude of machine data which at the moment is primarily recorded for reporting purposes only. However, providing the right methods of evaluation are applied, there is considerably more data available which sometimes contains a lot of information, such as on the degree of wear of a part.

Collecting this data is merely the first step in the process (cf. Figure 1). It is the analysis thereof which turns this data into information which can be used during maintenance, such as information on a pending failure of components. At the same time, however, the analysis process must also monitor the product in real time – where possible – and indicate a pending failure using mechanisms which are easy for everyone to understand (a traffic light system, for example).

By using suitable methods of evaluation a failure can be predicted well in advance, allowing maintenance events to be scheduled and planned in good time. Parts can also be procured and personnel planned in a timely manner, permitting vacation periods to be accounted for, for example.

Each worker is specifically provided with the spare parts and tools needed for each maintenance event, eliminating long searches for parts or equipment. The worker can therefore perform maintenance measures faster than in the past and afterwards precisely document which work has been carried out.

## The preventive maintenance project by KHS and Bavaria N.V.

The preventive maintenance project has taken an important step towards monitoring the condition of the machine and predicting faults. KHS GmbH and Bavaria N.V. implemented the joint project in several different stages (cf. Figure 2). An analysis was first made to identify critical parts and components. These parts and components were then assessed to determine an order in which solutions were to be found. These solutions were tested at the Kleve plant on a KHS Innopack Kisters machine and, once these had proved successful, directly installed at Bavaria N.V. Algorithms are currently being developed to evaluate data more efficiently than has been the case to date (fig. 2).

The production process is very well documented at Bavaria N.V., meaning a wide range of data was already available at the start of the project. For instance, each downtime, maintenance measure and – if known – the reason thereof are recorded. Even supposedly minor downtimes, caused by a downed product, for example, are noted. The machines supplied by KHS GmbH are of course already providing assistance here, as each fault detected by the machine is stored in the Human Machine Interface (HMI) where it can be clearly identified by its error code and read out. The data this generates was evaluated and a historical profile of the examined packaging machines drawn up. This profile provided information on recurring errors and the remedial action taken. It was thus possible to see exactly which faults had occurred when and how often, what impact these had had and which actions had helped to remedy the fault.

The faults which either occurred particularly often or led to long, unplanned downtimes were first selected using a method based on Failure Mode and Effects Analysis (FMEA) in order to work out suitable solution concepts. Part of this solution concept was always to detect the fault as early as possible. It transpired that many problems could already be determined from the data generated in the machine. Sensors only had to be retrofitted to cover a few points.

The ensuing steps taken to develop a suitable solution concept and ultimately a finished solution shall now be elucidated in the following two select examples. The first

example clearly demonstrates how existing data can be used for evaluation during preventive, condition-based maintenance. The second example illustrates how the use of just one sensor can give customers a number of benefits.

## Example 1: monitoring servomotors and connected components

The packaging machines from KHS GmbH can be optimally adapted to suit the individual requirements of the customer. To this end the modular machines are individually assembled for each and every customer. Controlled servomotors are used in the machines at several points in the process.

These servomotors are controlled by means of a programmable logic controller (PLC). Commands are sent to the servomotors at millisecond intervals and at the same time the current position is recorded. The controller thus ‘knows’ at all times which position a motor currently has and how to proceed so as to achieve the set profile. Data needed for control or computed from the controller, such as flows, torques, positions and temperatures, etc., is already available but used exclusively for control purposes.

It is possible to read out the aforementioned data. This, however, is on the condition that 1) there is sufficient computing power available so that the production process is not disrupted and 2) there is enough storage capacity to save the amount of data generated. Cloud systems and big data provide possible solutions here; these can be tailored for each individual client. Fast data access – necessary for evaluation – can thus be ensured, also after a readout.

The data is evaluated immediately with a number of objectives. Firstly, the amount of wear in the drives and their load is detected. Applying descriptive statistics methods the system can then ascertain whether or when a drive has to be replaced. The same applies to the monitoring of any installed couplings or gears. Their state is recorded by monitoring ‘jumps’ and ‘knocks’ in the torque graph (fig. 3).

Monitoring the torque also provides information on the masses transported which in turn is used to detect the wear on conveyor belts, for example. Using artificial intelligence processes this information is compared to the messages contained in the HMI. In this way operators can predict when belts have to be replaced.

Monitoring just a few signals therefore allows several components to be monitored. Servomotors, couplings, gears and belts are just a few of the components which can be continuously monitored by evaluating control data.

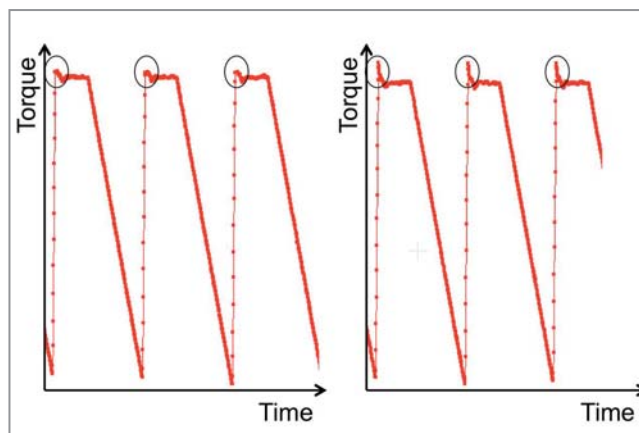


Fig. 3: left: torque graph of a new, controlled servomotor; right: torque jumps caused by coupling wear

## Example 2: detecting wear-related changes in length of roller chains

By the nature of their design the roller chains often used on packaging machines – and also in other fields of industry – are subject to wear. This wear is manifested in a change in the chain length. This effect is a well-known fact and can lead to problems in many areas. When the length of a chain alters, synchronization is no longer ensured at the transition points and products can no longer be transferred, resulting in disruptions in production.

To compensate for changes in chain length the timing for transition can already be exactly configured in the HMI. By tracking the new configuration an overall change in length could be determined which would, however, be very inaccurate. It is nevertheless necessary to discern the overall change in chain length as this is a measure of the amount of wear. If the change in length exceeds a value of 3 % as a general rule (values which deviate slightly from this are mentioned in specialist literature and by manufacturers), it is also assumed that the actuating gear wheels are worn.

Particularly worn chains also tend to skip a cog on the gear wheel. If this happens, synchronization is no longer ensured and there are also problems in production. Other effects, such as soiling, can also cause chains to jump. The consequences of this are usually serious, as the chain first has to be put back into its correct position – yet the correct position is not known.

A system has been developed which precisely detects the position and length of the chain. Jumps can now be directly recognized and stopped before the process is disrupted. Resetting the chain is only necessary with paired chains. Otherwise, the zero point can be reconfigured and production immediately resumed. Synchronization is also ensured by a correction value being directly entered into the HMI. The operator can immediately adopt this (fig. 4).



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**Christof Heil**  
Kelterei Heil OHG,  
Laubus-Eschbach,  
Germany

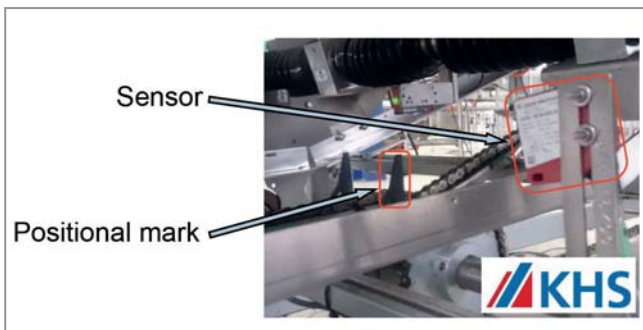


Fig. 4: Sensor for detecting changes in length of roller chains

Another positive effect is that replacement of the chain can be precisely calculated. Using learning algorithms the behavior of the chain is extremely accurately predicted, enabling chain replacement to be planned in the long term.

### Conclusion

The way to preventive maintenance lies in the evaluation of available data. Recording and storing this data no longer poses a great problem in our day and age. Thanks to cloud computing, big data and the many endeavors being undertaken in the name of Industry 4.0 the general conditions are a given.

The difficulty instead lies in the evaluation of the collected data. Years of company experience are called for here. Through the strategic partnership of KHS GmbH and Bavaria N.V. as the operator of several systems, KHS GmbH has the necessary application expertise to be able to usefully analyze machine data.

The specialists from KHS GmbH apply various methods taken from the field of descriptive statistics and artificial intelligence to permit appropriate early detection for all potential faults. Only when several methods are combined can the failure of a component also be predicted with any accuracy. This gives the customer a number of benefits. Spare parts can be ordered just in time, thus preventing large stocks of spares. Maintenance can be planned efficiently and in the long term. Unplanned downtimes are avoided through continuous, automated monitoring processes. System availability is ultimately increased and at the same time costs for maintenance are reduced.

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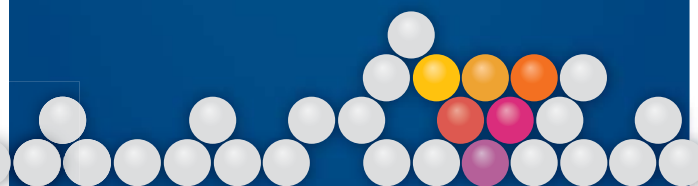
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# FRUIT PROCESSING

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# Hygienic Dispenser for fruit and vegetable pastes

ViscoTec's endless piston principle is committed to filling and dosing applications to the highest standard of hygiene

| Aseptic Filling | Fruit Pastes | Hygienic Dispenser | Piston Principle |

Food – a supplier of energy to the human body. If not here, then where else should the requirements for the highest degree of quality and processing be delivered? In production processes particularly it is the expectation that the highest standards of hygiene are met and at the same time the materials to be processed are handled gently. Food standards, just as in the pharmaceuticals industry, are commonplace and aseptic filling is state of the art.

Liquid or paste products of a highly viscous nature with particles and bits in are still very sensitive when processed and filled. New, unprecedented product lines in the food industry show limits in existing production structures. For example: “individual food” - one of the major trends in the industry. This includes foods and beverages which are not available off the shelf and produced in large batches, but tailored to the consumers' needs and produced on demand. “Personal food” contains favourite flavours and specific ingredients. Even “functional food” and “super foods” are on the market - these include custom smoothies with health-promoting properties or fitness bars tailored to each type of sport. For allergy sufferers, special food, which does not contain allergens, can be produced as if “home-made”. For each of these trends, new unconventional production methods are demanded, with the same level of standard of hygiene to be met. This is a real challenge for existing production lines.

Where there is a vision, there is a way. The focus will be in new capabilities in the production process. But how can this be incorporated in practice? How can a small number of products be produced, as individually as possible? How can a range of products be produced which are completely different to the rest of the product range? And how can the same conditions be maintained when a large output of products are to be produced? Is it possible that only the basis is created through restructuring the process? Or is there a multifunctional way of varying the formulations for producing, filling and dosing? Yes, there is! And with it, even individual products, as well as large batches, can be produced. The result? Flexibility in the era of Industry 4.0.

Precisely for this purpose, ViscoTec is offering a new product: the hygienic dispenser (fig. 1). Thus both challenges in production can be overcome. With the highest standards of hygiene, the dispenser allows highly viscose and sensitive liquids to be filled to perfection. Through small and very precise filling volumes, not only can raw materials be spared and small batches produced and filled, but also individual products can be produced. The dispenser can be integrated into fully automatic filling lines. The compact design of the VHDs makes it possible to combine different fillings with one another, so as to find the best possible arrangement for multiple fillings.

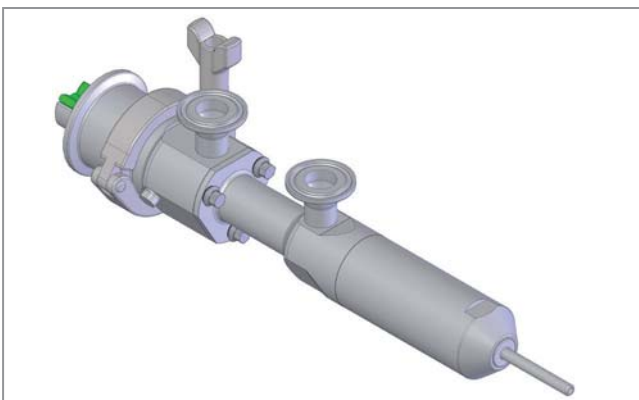


Fig. 1: The ViscoTec Hygienic Dispenser (VHD)

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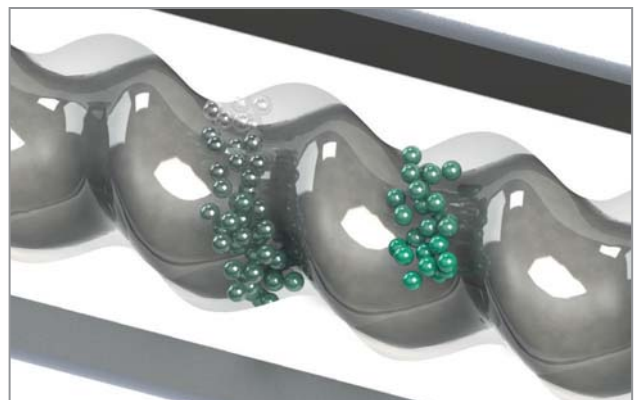


Fig. 2: The ViscoTec endless piston principle

The ViscoTec Hygienic Dispenser is available in different sizes and, in addition to FDA-compliant components, has an automatic cleaning function. It can be easily integrated into established filling lines and processes. The smallest of dosage volumes can be effortlessly dosed with a deviation of only +/- 1%. The precision and repeatability of the filling has been proven in a numerous series of tests and trials, irrespective of the tested medium.

### Endless piston principle technology

The Hygienic Dispenser from ViscoTec uses the proven endless piston technology, which has been adapted for the specific requirements of the food industry. The endless piston principle belongs to the group of rotary positive displacement pumps and is based upon volumetric pump technology. Its operation is similar to a continuous piston, which transports the product from the suction side to the pressure side and therefore a difference in pressure is built up. The interaction of an eccentrically moving rotor and stator results in a conveying and filling characteristic which is comparable to that of an endlessly moving piston.

Thanks to the dosing geometry, a constant volume, proportional to the rotary angle is always generated per revolution. The flow direction is reversed by changing the direction of rotation. The volume is thus clearly defined by the angular degree. This technique comprises of pressure-resistant, linear pump characteristics which make a clear statement about the relationship between revolution, time and delivery. This in turn leads to a guaranteed dosing accuracy of around 1% (depending upon the medium) at the pump outlet, which is often well below this in practice. A further benefit of this technology lies in the resulting conveying chamber, the volume of which remains absolutely constant when in motion. This makes it possible to promote and fill solids-laden media and even lumpy products. Another advantage over other pump mechanisms: in over 95% of applications, filling and dosing valves can be eliminated, since a reverse flow at the end of dosing allows for a controlled breakage of the product thread and therefore prevents any dripping. Thus, even the most difficult, highly viscous liquids can be reliably dosed or filled, without causing pulsation, incorrect dosages or an excessive stress on the material.

In contrast to conventional filling technologies, such as piston fillers, the dispensing volume can be adapted directly during the filling process. The volume expelled is accurately defined by the number of revolutions of the pump, thanks to the volumetric filling principle. Modifying this rotational speed alters the dosage variable without mechanically adjusting the pump or stopping the process for any period of time.

The VHD, through its easy handling and controlling, can be integrated into semi-automatic, as well as individualized, product processes and effortlessly integrated into established filling lines and production concepts with existing SPS.

The principle of eccentric screw technology has been constantly developed and optimized by ViscoTec. The benefits of this technology can be best applied in the function of filling pumps or dispensers. The development of the core components – rotor and stator – is always at the forefront, especially in terms of increasing requirements in the food industry. For difficult materials, such as highly concentrated flavorings, suitable stator materials can be selected to dose the flavoring perfectly, without causing wear.

### ViscoTec systems: from emptying the barrels to filling

Together with the dispensers and filling pumps, ViscoTec GmbH can implement a complete dosing or filling system including feed lines. Dispensers are also employed in the emptying of different types of barrels. Here, the advantage of these systems is that the barrels are gently and almost completely (with a residual amount of <1 %) emptied. Through a combination of filling pumps or dispensers, a complete feeding and filling system can be created, which acts independently and is controlled by a pressure sensor. The complete process from barrel emptying up to the filling pump operates independently. Barrel emptying is controlled by pressure sensors at the entry point of the filling pump and generates new material as needed. Emptying of the barrel itself is controlled by sensors and a signal warns the operator in plenty of time that the drum is empty and needs to be replaced. Such systems from ViscoTec GmbH are often found in the use of emptying fruit or vegetable paste of various concentrations, such as tomato puree.

### Effortless dosing and filling of thick pastes



Fig. 3: Fruit puree dispensed onto yoghurt

One of the largest benefits of this technology and the small dispenser is that highly viscous pastes and liquids can be easily pumped and filled. With a viscosity range from several million mPas, the pump can still operate with the same values of accuracy as low-viscous media. In the past, it was only possible to minimise the viscosity of highly viscous pastes through tedious heating and tempering. This thermal processing





Fig. 3: Smoothies can be filled by VHD

This is important for the filling of jams, soups or even dressings and sauces for example. The dispenser can be used for a wide variety of formats. A major area for filling systems is the filling of tubular bags to produce sachets. The VHD is also used in other configurations. Filling is not only possible in all standard types of packaging, but also in small packaging and sample-sized packaging requiring very small dosages. The compact construction of the Hygienic Dispenser enables its positioning directly above the filling line, without the need for long pipes or hoses with valves. A further advantage of the new dispenser is a completely clean filling thanks to the flexible suck back. There is no dripping and no unpleasant adhesion to the filling device.

affects not only the product itself, but brings with it high running costs and increased production time. Filling with conventional technologies was only possible until this treatment had first been carried out. In contrast, the endless piston technology enables a direct, effortless filling of high viscose and thick pastes without tempering. Thanks to this technology, not only are the energy costs reduced, but the complete thermal treatment stage in the production can be eliminated. By removing this obstacle users are offered new possibilities for process planning. Nothing stands in the way of products which until now could not be implemented due to lack of production facilities or could only be produced with difficulty.

### Smoothies, fruit pastes and purees... perfectly posed

The new Hygienic Dispenser from ViscoTec allows for easy and very gentle filling of fruit pastes and purees, and even smoothies, into a variety of packaging sizes. The valuable ingredients remain in the fruit pastes, vitamins and fruit pieces, and are neither "squashed" nor destroyed under high pressures. Even large fruit and vegetable chunks can be easily filled. The pieces are gently eased into the filling pump and not sheared or destroyed, but maintain their form and consistency.



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## Hygienic process

The design of the dispenser allows it to be automatically rinsed and cleaned, as well as manually (following disassembly). In fully-automated filling lines, a standard CIP or SIP system can be used. Within a few minutes and just a few operations, the dispenser can be disassembled manually and the individual components cleaned. The dispenser has been optimized to avoid dead volume and designed in accordance with the general guidelines for hygienic design to prevent contamination through micro-organisms.

With this new generation of dispenser, the VHD, ViscoTec has succeeded in transferring the proven endless piston principle of large pumping systems into modern and innovative dispensing systems, and has developed it further to take into account hygienic requirements. Likewise, the VHD can be easily integrated into fully automated production systems, facilitated by its low weight. The range of applications is huge: where existing filling technologies reach their limits, the ViscoTec principle achieves a quantum leap in the filling process.

**Author:**

**Wolfgang Merklein**, Head of Food & Cosmetics, ViscoTec Pumpen- u. Dosiertechnik GmbH  
www.viscotec.de

## ViscoTec in brief

ViscoTec primarily deals in systems required for conveying, dosing, applying, filling and emptying medium to high-viscosity media. The headquarters of the technological market leader is in Töging (Upper Bavaria, in the district of Altötting). In addition, ViscoTec has subsidiaries in the USA, in China and in Singapore and employs about 120 people worldwide. Many traders around the world extend this international distribution network. In addition to sophisticated solutions even in the most complicated tasks, ViscoTec offers all components for a complete application from one source: from procurement, through to product preparation to dosage. This guarantees a successful interaction of all components. All fluids with a viscosity of up to 7.000.000 mPas can be conveyed and dosed almost pulsation-free and with extremely low pressure. For each application there is comprehensive consultation - and where necessary in collaboration with the customer - extensive tests are carried out. ViscoTec dosing pumps and dosing systems are optimally adjusted to the respective application: in food applications, in the automotive, aerospace, medical, pharmaceutical and in many other industries.

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# Zappar magic: SIG Combibloc carton packs become an interactive experience

| Augmented Reality | Carton Pack | Interactive Experience | Packaging | Zappar |

Welcome to a new world! Augmented reality (AR) opens up a new dimension of on-pack marketing. Partnering with Zappar, one of the world's leading developers and providers of AR, SIG Combibloc is turning carton packs into interactive and engaging experiences. The technology provides a bridge between physical objects and the digital world in real-time. All you need is a smartphone or tablet, the Zappar App and off you go: content is brought to life. The first SIG Combibloc carton packs with Zappar's "zapcodes" are already on sale. The technology offers scope for a whole range of creative marketing ideas and campaigns – infotainment – that will engage and delight consumers.

Ace Fung, Global Product Manager at SIG Combibloc: "Our aim is to offer our customers a solution to get closer to their end-consumer and engage with them through the brand's packaging design. This "smart packaging" connects a product with the digital content and rewards consumers with relevant targeted content for taking the time to engage with a brand. Letting the consumer explore hidden content provides brands an excellent opportunity to improve brand awareness and strengthen brand loyalty. Linking AR to our customers' digital brand strategy allows further insight into end-consumers. That is why we have partnered with Zappar following a full review of the augmented reality offerings on the market. We feel their platform gives us the best and most scalable solution to deliver engaging digital experiences on mobile through AR. We believe this strategic partnership between SIG and Zappar supports us in providing our customers a value-added solution in a more and more digitised world".



Fig. 1: Ace Fung, Global Product Manager at SIG Combibloc: "We believe this strategic partnership between SIG and Zappar supports us in providing our customers a value-added solution in a more and more digitised world".

In simple terms, 'augmented reality' (AR) means the computer-assisted extension of the perception of reality. The "real view" is supplemented in real-time by additional information that is layered onto a mobile device's screen. Very early examples of this are digitally superimposed off-side lines or the distance to a goal of a free-kick in a football TV coverage. With the development of smartphones and tablets, augmented reality has made the leap to mobile applications. For the industry, this opens up opportunities to present brand information and product value to consumers in a different way – the emphasis is on providing an engaged experience.

Ace Fung: "Digital content now leaps ahead through augmented reality, the supplementary information is provided in real-time – for example in 3D, as a game, video, text or animation. The advantage is that the information is made available right there and then, when it's needed. Augmented reality opens up a whole new dimension of interaction between product and customer. Information is



Fig. 2: Augmented reality (AR) opens up a new dimension of on-pack marketing. Partnering with Zappar, one of the world's leading developers and providers of AR, SIG Combibloc is turning carton packs into interactive and engaging experiences. Most AR applications work with what is known as visual-based augmented reality. With this technology the device's camera searches, on the basis of a comprehensive computer algorithm, for certain images which act as triggers and bring the 'hidden' content to life. These apps are very complex and can capture and analyse at least 30 images per second, allowing the user to enjoy a captivating 3D experience. © all photos SIG Combibloc

presented as infotainment – integrated into a modern packaging design and tailored to the relevant target audience and the relevant subject matter. Through this interaction, the consumer is immersed with a product more deeply than before, allowing simple information to become an experience.”

**Smart packaging design**

A recent study by Germany’s Federal Ministry of Food and Agriculture has shown that when buying food, 20 percent of consumers already use their smartphones to find further information about products right at POS. The industry is taking a new approach to on-pack marketing and bringing it in line with the needs of modern consumers and new buying trends. Ace Fung: “Food and beverage manufacturers should look at these behavioural changes as opportunities to create engaging packaging designs with this tech that address consumer’s needs in an interactive way”.

**Launched in Brazil**

AR on SIG Combibloc carton packs were initially launched in Brazil, where SIG Combibloc Brazil presented for the first time the new technology at Fispal 2015. Together with Massfar, a Brazilian Authorised Partner of Zappar, various concepts were developed on carton packs for the local market (<https://youtu.be/jGgbhOTH-2o>).

The feedback from Fispal visitors on the new AR technology was consistently positive. The outcome: two customers have already signed up for Zappar, and their carton packs



Fig. 3: The use of AR on SIG Combibloc carton packs were initially launched in Brazil, where SIG Combibloc Brazil presented for the first time the new technology at Fispal 2015. Together with Massfar, the Brazilian Authorised Partner of Zappar, various concepts were developed on carton packs for the local market.

with zapcodes are already on sale. Marajoara Alimentos and Sabe are leading the way with engaging infotainment supported by Zappar’s technology.

**Expansion already planned**

Marajoara has used zapcodes on carton packs since the beginning of 2016. With the company’s sweetened condensed milk, AR content delivers a video which encourages the user to prepare a dessert using the product.



Fig. 4: Marajoara has used zapcodes on carton packs since the beginning of 2016. With the company’s sweetened condensed milk, AR content delivers a video which encourages the user to prepare a dessert using the product. The company’s chocolate milk carton packs also hides a surprise, an environmental quiz which invites children and adolescents to find out how to protect the environment in a fun and educational way.

The company’s chocolate milk carton packs also hides a surprise, an environmental quiz which invites children and adolescents to find out how to protect the environment in a fun and educational way. Furthermore, consumers can take a selfie with the company’s ‘Chokynho’ brand’s cartoon figure, and then post it on social networks. André Junqueira, Managing Director of Marajoara: “For us, innovations like this are crucial to enable us to offer our customers added value time and time again”.



Fig. 5: Zapcodes can be unique per SKU or individually generated per object. The Zappar App provides brand owners the ability to evaluate a “Zappar-powered” campaign through their data dashboard (end-consumer usage data). The App also has the flexibility to be integrated into a brand’s existing App.

Brazilian company Sabe also sees opportunities with Zappar. Consumers can scan the zapcode on packs of the company's lactose-free milk to receive information to their mobile devices on how lactose-free milk is produced along with recipe suggestions.

Ace Fung: "The more interactive and engaging the content is, the more likely it will resonate positively in consumers' minds. With the aid of AR, brand owners can expand the experience beyond the product itself, and enable consumers to interact closely with the brand. Ultimately, this has a positive impact on brand image and sales".

Max Dawes, Partnerships Director at Zappar added: "We like working with thought-leading brands who are thinking deeply about how they can reimagine the relationship between their physical products and the digital world. One of the reasons we are so excited to be partnering with SIG Combibloc is their commitment to delivering class-leading solutions in this brave new world. Packaging is a perfect use case for our technology. It is the 'earned media' in consumers' homes, sitting on the kitchen table, that can be made into an interactive multi-media portal – surprising and delighting consumers whilst providing a huge amount of data for the brand." Short video on SIG and Zappar: <https://youtu.be/Hkg2XcV6MMU>



**Autorin:**  
**Heike Thevis,**  
SIG International Services GmbH  
[www.sig.biz](http://www.sig.biz)

### Zappar in brief

Zappar is the world leader in augmented reality ("AR") on mobile devices accessible through its free-to-download app on iOS and Android. Zappar specialises in AR-enabled products and entertainment experiences: working closely with brands, license partners and retailers across the world to produce innovative, customizable market-leading solutions as bite-sized entertainment. Partners include Activision, Sony Pictures, Sony Music, Warner Bros, Hasbro, Universal Pictures, Pedigree Books, Crocs, Morphsuits, Moonpig.com, Coca-Cola and Asda amongst others.

[www.zappar.com](http://www.zappar.com)

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## AUSTRALIA

Company: Campbells  
Country: Australia  
Category: Juice & Juice Drinks  
Event Date: May 2016  
Price: USD 2.52 EUR 2.31



**Description:** This V8 Fruit and Veggie Fusion is made from a blend of fruit and vegetable juices including apples, sweet potatoes, pineapple, carrots, oranges, bananas, mangoes and passion fruit, giving the goodness of vegetables, but you'll taste the fruit. Comes in a brick liquid carton pack with straw.

**Claims:** Provides 1 serve of veggies and 1 serve of fruit per 250ml serve. No added sugar or preservatives. No artificial flavors or colors. Provides 100 % RDI of vitamin C and 40 % RDI of vitamin A per 250ml serve.

**Ingredients:** Apple 37 %, sweet potato 16 %, pineapple 15.5 %, carrot 14.5 %, orange 10.5 %, banana 4 %, mango 1.5 %, passion fruit 1 %; reconstituted juice.



## BELGIUM

Company: Delhaize  
Country: Belgium  
Category: Juice & Juice Drinks  
Event Date: May 2016  
Price: USD 2.61 EUR 2.39



**Description:** Flash pasteurized pineapple, apple, guava and baobab fruit juice drink, in a 750ml plastic bottle..

**Claims:** Recyclable packaging. Green Dot Certified.

**Ingredients:** 70 % pineapple juice, apple juice (17.5 %), guava puree (12 %), baobab extract (0.5 %).



## CANADA

Company: Loblaws  
Country: Canada  
Category: Juice & Juice Drinks  
Event Date: May 2016  
Price: USD 2.54 EUR 2.33



**Description:** A blend of banana puree, concentrated fruit juices from pineapple, apples and lemons, coconut cream, oat sprout powder and other ingredients. Comes in a plastic bottle.

**Claims:** High fiber. No artificial flavors or artificial colors. Pasteurized. Contains 4g of fiber per 250ml serving. Recyclable packaging.

**Ingredients:** Water, banana puree, concentrated fruit juice, (pineapple, apple, lemon), coconut cream, oat sprout powder, gum arabic, ascorbic acid, (vitamin C), citric acid.



## DENMARK

Company: James White Drinks  
Country: Denmark  
Category: Juice & Juice Drinks  
Event Date: June 2016  
Price: USD 2.62 EUR 2.28



**Description:** Organic concentrated beetroot juice and lemon juice made from concentrate, in a 70ml plastic bottle.

**Claims:** Organic. Natural juice. Contains on average 300mg natural dietary nitrate per shot.

**Ingredients:** Concentrated beetroot juice (98 %), lemon juice (2 %); made from concentrates.



## FRANCE

Company: Alain Milliat  
Country: France  
Category: Juice & Juice Drinks  
Event Date: June 2016  
Price: USD 3.32 EUR 3.05



**Description:** Summer pear nectar in a 330ml glass Green Dot Certified. Keep refrigerated up to 3 days after opening.

**Ingredients:** Summer pear pulp 50 %, water, sugar, acid: citric acid, antioxidant: ascorbic acid.



## NORWAY

Company: Juiceriet  
Country: Norway  
Category: Juice & Juice Drinks  
Event Date: June 2016  
Price: USD 9.57 EUR 8.70



**Description:** Cold-pressed organic juice shot from 70 % ginger and 30 % lemon. Comes in a 250ml plastic bottle.

**Claims:** Organic. Raw and gluten free. Shake well. Store cool.

**Ingredients:** 70 % ginger and 30 % lemon ; from approved organic agriculture.

## NEW PRODUCT LAUNCHES



### ITALY

Company: Bevi Pi Naturale  
Country: Italy  
Category: Juice & Juice Drinks  
Event Date: May 2016  
Price: USD 1.05 EUR 0.96

**Description:** Calabrian blood orange juice drink in a glass bottle.

**Claims:** Authentic. No preservatives and artificial flavors. Contains 21 % juice.

**Ingredients:** Water, blood orange juice 21 %, sugar, black carrot juice, carbon dioxide.



### SWITZERLAND

Company: Friya  
Country: Switzerland  
Category: Juice & Juice Drinks  
Event Date: May 2016  
Price: USD 1.77 EUR 1.63

**Description:** Superfood drink with rose blossom, sour cherry flavors and basil seeds, in a plastic bottle.

**Claims:** Suitable for vegans. No added sugars. No added preservatives. Lactose free. Contains 34 kcal per 100ml. Basil seeds are highly valued because of their characteristics in ayurveda. In Friya, they act together with the delicate aroma of rose blossom and sour cherry and free yourself from the small appetite. Curbs your appetite. Made with the good stuffs. Green Dot Certified. Recyclable packaging. Contains naturally occurring sugars.

**Ingredients:** Water, apple extract, bitter cherry juice from concentrate 9 %, lemon juice from concentrate 2 %, basil seeds 1.5 %, acidity regulator: calcium lactate, trisodium citrate, natural flavor, stabilizer: gellan gum; rose blossom extract.



### UNITED KINGDOM

Company: Marks And Spencer  
Country: United Kingdom  
Category: Juice & Juice Drinks  
Event Date: May 2016  
Price: USD 3.00 EUR 2.76

**Description:** Zingy and refreshing pasteurized white grape and lime juice drink with flavorings, in a 750ml plastic bottle. Delicious on its own or add pisco for a cool cocktail.

**Claims:** Spirit of summer. Suitable for vegetarians and vegans. Best served chilled. This product may naturally separate. Shake well before serving. Keep refrigerated between 0 to 5 degrees Celsius. Once opened, consume within 4 days. Not suitable for freezing.

**Ingredients:** Water, white grape juice (20 %), lime juice (18 %), sugar, flavorings



### UNITED STATES

Company: Bolthouse Farms  
Country: United States  
Category: Juice & Juice Drinks  
Event Date: June 2016  
Price: USD 4.09 EUR 3.76

**Description:** Cold pressed coconut water, pineapple, mango, avocado and lemon juice in a plastic bottle.

**Claims:** USDA organic. Non-GMO. 100 % vegetable and fruit juice concentrate. High pressure processed. Certified kosher. No added sugar. Suitable for vegans. Not heat pasteurized. Gluten free. Non-BPA packaging.

**Ingredients:** Organic coconut water, organic pineapple juice, organic mango puree, organic avocado puree, organic lemon juice.



### UNITED STATES

Company: Harvest Soul  
Country: United States  
Category: Juice & Juice Drinks  
Event Date: June 2016  
Price: USD 4.50 EUR 4.14

**Description:** Organic probiotic juice blend made with celery, carrot, pineapple, cucumber, orange and beet, in a 354ml plastic bottle.

**Claims:** Contains 100 % juice from whole fruit and vegetables. Supports digestive and immune health. Certified USDA organic. Non-GMO project verified.

**Ingredients:** Organic celery, organic carrot, organic pineapple juice, organic cucumber, organic orange juice, organic beets, organic kale, organic lime juice, organic lemon juice, organic spinach, organic ginger, probiotic: *Bacillus coagulans* GBI-30 6086.



*In cooperation with Innova Market Insights we are happy to publish new product launches on a global scale. Innova is primarily an online new product development tracking tool, using a network of international field researchers to report on new food and drinks launches from around the world. Innova however goes beyond this and provides in-depth analysis on new products, trends and a customized service from their researchers.*

*Presenting the latest product launches world-wide will help you monitor category and sector activity, explore trends and generate ideas, staying one step ahead of the competition.*

For more details and more products please contact:  
Dominik Herwald, Innova Market Insights BV;  
[dominik@innovami.com](mailto:dominik@innovami.com) and visit [www.innovadatabase.com](http://www.innovadatabase.com)

**Completion of Ball and Rexam beverage can acquisition**

Ardagh is pleased to confirm that, further to its announcement of 25 April, 2016, its acquisition from Ball Corporation and Rexam PLC of certain metal beverage can manufacturing assets and support locations in Europe, Brazil and the United States, was completed.

**Ardagh Group**

Ardagh Group is a global leader in glass and metal packaging solutions, producing packaging for most of the world's leading food, beverage and consumer brands. Following completion of this acquisition it operates 110 facilities in 22 countries, employing over 23,000 people and has global sales exceeding US\$ 8.8 billion.



(© Ardagh)

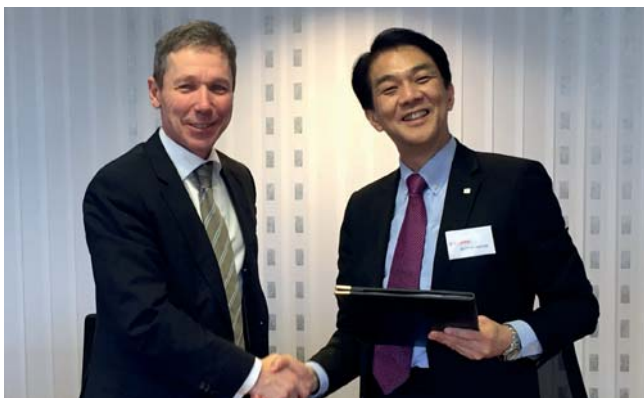
Print and online edition available! Have a look at [www.fruit-processing.com](http://www.fruit-processing.com)



**Elopak and Nippon Paper Industries enter license agreement**

Nippon Paper Industries Co., Ltd. entered a license agreement with Elopak AS Norway for the introduction of Pure-Pak® carton shapes into the Japanese market.

The agreement covers the production of Pure-Pak® Classic cartons with Curve® feature and Pure-Pak® Sense cartons. These carton shapes are acknowledged for their



Elopak CEO Niels Petter Wright (left) and Yasuhito Obayashi, Associate Director Paper-Pak Division, Nippon Paper Industries signed the License Agreement at Elopak Headquarters in Norway. (© Elopak)

sophisticated design and improved functionalities. Furthermore will closures be applied to the cartons for consumer convenience. The new carton shapes have already proven track records for high value-added products such as dairy drinks, soft drinks, and functional drinks in Europe.

Nippon Paper Industries has since 1965 produced and sold gable-top cartons under the “NP-PAK” brand and is Japan’s leading company for gable-top liquid packaging cartons. The new Pure-Pak® design features and shapes, as well as the introduction of closures will further strengthen Nippon Paper Industries position in the market by meeting increasing consumer demands for improved functionality.

**Nippon Paper Industries**

Nippon Paper Industries Co., Ltd is a Japanese paper manufacturing company. The company’s stock is listed on the Tokyo Stock Exchange. As of March 2016 the company has 38 subsidiaries and 10 associate companies. It is listed as one of the world’s top 10 pulp and paper industry companies.



**Dai Nippon Printing and SIG Combibloc to collaborate in Japan**



Tokyo-headquartered Dai Nippon Printing Co., Ltd. (DNP) and SIG Combibloc have reached an agreement to collaborate in the food and beverage carton business for the Japanese market. In June 2016, the partners commenced preparations to target sales and business promotion activities in Japan – in the picture Kouichi Hashimoto, Senior Executive Corporate Officer at DNP (left), and Markus Boehm, Chief Market Officer at SIG Combibloc (right).

(© SIG Combibloc)

Tokyo-headquartered Dai Nippon Printing Co., Ltd. (DNP) and SIG Combibloc have reached an agreement to collaborate in the food and beverage carton business for the Japanese market.

In Japan, cartons for beverage use come in only two major formats – a gable top type and a brick type – with resulting limited scope for product differentiation.

Since 1978, DNP has developed and marketed cartons for use with soft drinks and alcoholic products, along with filling systems. Alcoholic beverage cartons and their filling systems have captured high sales shares, and DNP’s aseptic filling system, such as for polyethylene terephthalate (PET) bottles has been adopted by many food and beverage manufacturers.

SIG Combibloc was the first manufacturer of carton packs to introduce a beverage carton in Europe and for more than 40 years has been a powerful player in the market for aseptic carton packs for beverage and food products.

This SIG Combibloc variety of carton packs, and notably the ability to fill products containing particulates such as fruit, will offer new value to the Japanese consumer.

The partners aim to capitalise on their strengths and track records to expand business in Japan through sales of SIG Combibloc’s carton packaging for food and beverages, along with the SIG Combibloc filling system. The objective is to rejuvenate carton packaging as one of the most eco-friendly packaging solution in the market.

**ASCO expand stainless steel filter regulator range with addition of a compact offering**

ASCO introduces a compact stainless steel filter regulator as an addition to their existing range. Boasting the highest flow rate on the market for its size, the new product is ideally suited for the control of process actuators when a compact solution is required without compromising on actuator opening and closing speeds. The compact Filter regulator complements an existing range of high flow stainless steel and aluminium filters, regulators and filter regulators.

Suitable for harsh environment applications such as offshore and onshore oil & gas, chemical & petrochemical plant and power generation applications, the new compact version is available in 1/4” size (with the existing range available in 1/4” and 1/2”). The ASCO stainless steel filter regulator boasts excellent flow rates – double that of others of its size on the market. This is made possible thanks to an optimised flow path plus a reinforced rolling internal diaphragm design, which also increases the

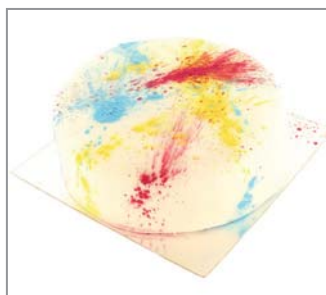
product’s longevity, particularly when combined with the high quality construction materials of the SSFR. ATEX 2014/34/EU, CUTR and SIL certifications complete the offering to the process industry.

The ASCO stainless steel filter regulator options complements the company’s extensive range of direct and pilot operated solenoid and pressure operated valves and is available on ASCO Express for reduced delivery times. Renowned for their high standard of engineering and reliability, these products and wider solutions are installed globally across many industries.



Compact SSFR with gauge (© ASCO)

**New EXBERRY® powders offer true natural and high-performing colours for instant beverages**



*Micronised powders can be used on all kind of applications in a creative way. (© GNT Group)*

The GNT Group, a leading global provider of Colouring Foods, expands its portfolio of innovations: it is the first to market a micronised powder range exclusively based on Colouring Foods under its EXBERRY® brand. The new product range is ideal to give vibrant and natural colours to instant beverages, sweet and savoury snacks,

pressed tablets and seasonings, as well as chocolate and compound coatings.

For the production of GNT’s micronised powders, only fruit, vegetables and edible plants like radishes, purple potatoes, black carrots, safflower and spirulina are used. As for all EXBERRY® Colouring Foods, only water and gentle physical processing methods such as pressing,

chopping and filtering are applied. No artificial additives, chemicals or organic solvents are included. The micronised powders are available in yellow, red, pink, purple and blue, and can be mixed to a wide spectrum of colour shades.

**Homogenous and stable colours for clear labelling**

The micronised powders have a reduced particle size of 15 µm. This strongly enhances the adhesion properties in dry applications, guaranteeing highly homogenous and intense colour solutions. Good water solubility and improved mixing stability for powder blends are additional major benefits of the new product range.

Micronised powders, like all Colouring Foods, are ingredients and not additives, and can therefore be declared on the ingredient list as Colouring Food (concentrate of black carrots and radishes), for example. They offer a perfect solution for clean label products and are suitable for vegetarian, kosher and halal food

**Natural Health Group, Inc. (NHGI) launches crowdfunding campaign for protein drink**



*Jenna's Clearly Protein is a water-based protein drink (© NHGI)*

“Being an entrepreneur can be challenging at the best of times. When you are a true cross border hybrid, with US manufacturing and, headquarters in Canada, it adds additional complexities,” says CEO Alison Prentice.

Prentice seeks to address this challenge for her company by reaching out

not only to individuals, but also corporations in both countries to support their non-equity crowdfunding efforts to reach production of their unique protein drink – Jenna’s Clearly Protein. To that end they have included 3 levels of corporate sponsorship on the crowdfunding platform Indiegogo – Small Business, Corporate Basic, and Corporate Challenge.

Jenna’s Clearly Protein is a water-based protein drink that refuels, refreshes, and rehydrates all in one. Low in sugar (only 5 grams compared to 39-76 grams in other “healthy” protein drinks) Jenna’s Clearly Protein was created with

pure whey protein isolate, virtually eliminating digestive issues typical of most other protein drinks (gas, bloating). It is also fat free, GMO free, lactose free, and free from artificial ingredients. Jenna’s Clearly Protein is the perfect snack size for adults and is ideal for the cafeteria or vending areas (and of course, home). And it’s a product that health practitioners can support – naturopaths, health stores, clinics and more.

Amazingly, this protein drink tastes great, without being smothered in sugar or artificial ingredients.

Each level of corporate sponsorship seeks to address the issue of health-related lost time due to fatigue – which costs employers \$134 billion annually. NHGI is encouraging business to align their Health & Wellness Programs with healthier offerings in their cafeterias and reduce the amount of junk food. A sponsorship is one way small businesses and corporations can receive this phenomenal product directly and try it out for themselves. Each of these corporate perks not only includes product at fair market value (FMV), but also FMV advertising on the NHGI product website.

**Putting the tea back into iced tea**

It's always been a bit of conundrum in the retail world - why is the UK the biggest tea drinking country in Europe and yet one of the smallest consumers of 'iced' tea?

This was the puzzle that drinks entrepreneur Guy Woodall set about solving three years ago. After a successful launch in mainland Europe, Guy believes he has found the answer through his exciting iced tea brand, Yum Cha.

Coming from a farming background Guy is no stranger to the beverage industry. He has grown elderflower on his farm for nearly three decades and is now one of the country's leading suppliers of elderflower extract to the drinks industry, processing around 40 tonnes each summer.

Guy also set up the drinks brand, named after his farm near Leatherhead, Thorncroft Drinks. Initially offering elderflower cordial, the range was quickly expanded to include other naturally flavoured cordials and fizzy drinks. Sold throughout the UK and abroad, with particular success in Japan, James White Drinks acquired the brand from Guy in 2011.

Selling Thorncroft Drinks didn't do anything to quash Guy's creative spirit however and, having had a passion for tea for many years, he turned his attention to iced tea and trying to solve the mystery of why it hasn't seen the same success here as in mainland Europe. Guy soon discovered that a big part of the issue lay in the lack of a 'tea' flavour in the commercial iced tea drinks available.



*Jenna's Clearly Protein is a water-based protein drink* (© NHGI)

So Guy set about trying to uncover why commercial iced tea didn't taste of tea. He quickly found it was linked to the way the drinks are preserved, which involves acidifying the tea. The process not only neutralizes the tea flavour, but also means high levels of sugar need to be added to balance the acid taste. The result is an offering that not only lacks a real tea taste, but whose high sugar content somewhat negates the concept of iced tea being a low sugar drink that quenches your thirst and can replace high sugar sodas and juices.

Guy also discovered that most commercial iced teas are made from instant powdered tea, which have certain elements of tea removed from them to prevent clouding, resulting in real tea flavours being reduced further. The overall result is that the tea taste in the drinks is lost almost altogether and other fruit flavours need to be added to give the drinks any substance at all.

**Coconut Water and Matcha – the newest hybrid ready-to-drink**

ITO EN, the Brooklyn (U.S.) based beverage company launched Matcha Colada, a new hybrid ready-to-drink under their award-winning line Matcha LOVE

The new Matcha Colada celebrates the authentic taste and restorative powers of Japan's famed green tea powder – matcha, and coconut water's hydrating benefits and natural electrolytes of potassium, calcium and magnesium. Made with 70 % coconut water from young coconuts harvested from Southern Thailand, the new Matcha Colada has no added sugar and is sweetened naturally with coconut water. Perfectly balanced with the fresh umami taste of 100 % pure matcha and vitality of ingesting the entire green tea leaf, Matcha Colada is only 80 calories per 16.9 fl. oz. bottle. Packed with powerful antioxidants and Vitamin C, matcha is known to enhance mood and be a

natural energy boost. Drinking matcha also gives a calm alertness and mental clarity, attributed to the amino acid, L-Theanine.

“Matcha Colada was inspired after experimenting with the top ingredient trends of matcha and coconut water,” says Adam Hertel, V.P. of Grocery & Natural Sales, “It led to a nice discovery that they balance and complement each other, not just in taste, but in their functional benefits. We are taking a fun and playful approach to a new hybrid product that hits on a current tea innovation trend.”



*Match Colada – the new hybrid drink* (© ITO EN)

**Makers of Clearly Kombucha release new line of botanical brews**



*C-Botanicals is America's first fermented, probiotic botanical beverage  
(© Clearly Kombucha)*

Top Shelf Beverages, brewers of Clearly Kombucha, the company dedicated to creating the most palatable, fun, and authentic booch, announces the launch of C-Botanicals, a collection of effervescent fermented botanicals and aromatics.

C-Botanicals is America's first fermented, probiotic botanical beverage. Just as kombucha is brewed by fermenting tea, this new line of beverages is made from fermenting some of Mother Nature's finest herbs and plants. With the addition of probiotics, each drink is a light, hydrating gift for your taste buds and your body. It is light but purposeful – truly a "me" drink.

The next generation of innovative and functional beverages, these probiotic drinks are available in five flavors:

- **Ginger Root:** Thought by many to be a cure-all, the ginger kick will supercharge your system with a fragrant jolt and a punch of flavor.
- **Holy Basil:** Renowned for health benefits ranging from antioxidant to antiviral to antimicrobial, it's a magical herb with a bright flavor.
- **Lemongrass:** Highly regarded by herbalists as a diuretic, tonic, and stimulant, lemongrass boasts a profuse and seemingly endless array of healthful, healing qualities, with a great taste to boot.
- **Strawberry Milk Thistle:** A health food shop staple, Milk Thistle is a surefire regenerative boost. With just a hint of strawberry's characteristic sweetness to complement the malty smoothness of the milk thistle, this strikes the perfect balance.
- **Turmeric Cardamom:** Discovered in India over 5,000 years ago, Turmeric has been known to reduce inflammation and ignite your metabolism. It livens up the drink with a gentle, subtle flavor, while cardamom gives it an exotic, complex boost.

"Clearly Kombucha has always been about providing delicious drinks that taste as great as they make your body feel," says CEO and Co-founder Ali Zarrow. "Now, with a focus on the plants that have been heralded as natural remedies for centuries, we have an exciting new opportunity to create a new kind of functional beverage."

Suggested retail price: US\$ 3.99 per bottle.

**Innova market Insights: Natural alternatives look to close the sweetness gap in soft drink**

Ongoing concerns about obesity and sugar intake have driven interest in reduced sugar and diet drinks in recent years. This has become even more focused with the arrival of the so-called Sugar Tax in the UK soft drinks industry in recent months and ongoing discussions about the possibility of implementation in some other major markets.

A 2015 Innova Market Insights survey found that sugar content influences the purchasing decision of soft drinks for 57 % of US consumers. For the UK, where a sugar tax will come into force in 2018, the figure is 60 %. For Mexico, where a sugar tax is already in place, 57 % of respondents said that sugar content influences their purchasing decision of soft drinks.

Over 16 % of global soft drinks launches recorded by Innova Market Insights in the 12 months to the end of March 2016 used either a no added sugar, low sugar or

sugar free claims. This type of positioning was particularly popular in juices and juice drinks, featuring in about one-fifth of introductions in the sub-category, rising to over 30 % in the US.

At the same time as this interest in sugar reduction there has also been an continuing focus on clean label formulations, which has worked against some existing non-caloric or low calorie sweeteners and caused a backlash against some ingredients perceived to be "artificial."

With interest turning to natural sweeteners, the spreading regulatory approval for stevia sweeteners in markets such as the US, Australia and then the EU over the past five years or so started something of a revolution in sweetener use. Soft drinks have been a key application area, accounting for 20 % of launches featuring stevia in the 12 months to the end of March 2016.

## BUSINESS CONTACTS

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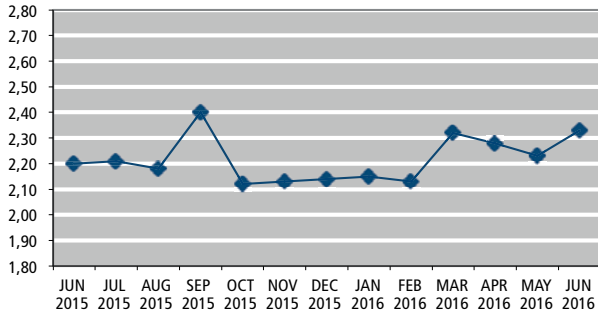
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phone +49 (0) 2634 9235-16 or cornelia.hebbe@fruit-processing.com

Orange Juice Concentrate

65 °Brix, \$/kg



(Price Information without Liability)

**Source:** Survey by confructa medien GmbH, from a minimum group of 5 marketers and 5 juice purchasers for each product. Since its first publication in 1991, more than 40 industry partners – manufacturers, traders, processors, bottlers, packers, bankers – have been contributing data.

Your price quotation data, too, is much appreciated.

Please direct your contributing input directly to the editorial team c/o christian.friedel@confructa-medien.com

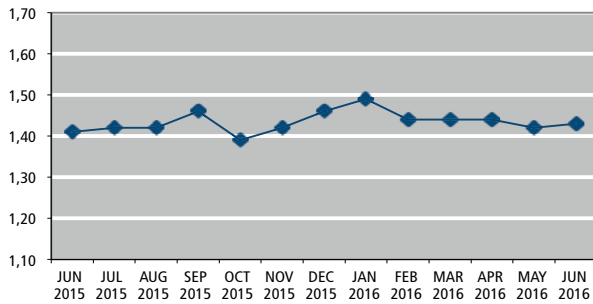
**Prices:** The price range is calculated for juice or puree of different proveniences, traded in drum or bulk; \$/kg = cif Rotterdam; EUR/kg = DDP

**Custom Duties:** The range encompasses preferential duties up to 30 %

◆◆ This line represents the development of the mean values (excepted graph 06 orange juice concentrate – future markets)

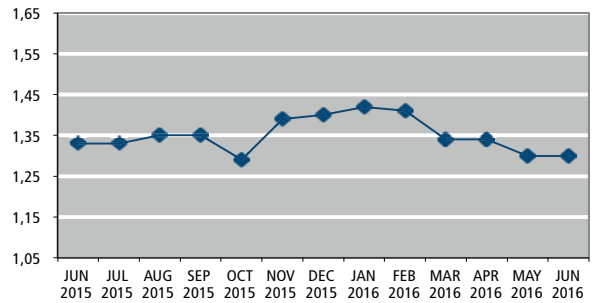
Apple Juice Concentrate

70 °Brix, high acidity, EUR/kg



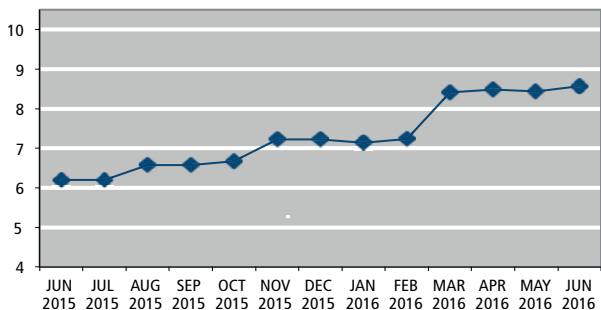
Apple Juice Concentrate

70 °Brix, low acidity, EUR/kg



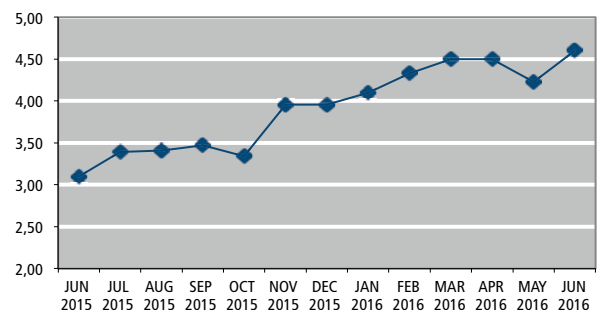
Passion Fruit Juice Concentrate

50 °Brix, \$/kg



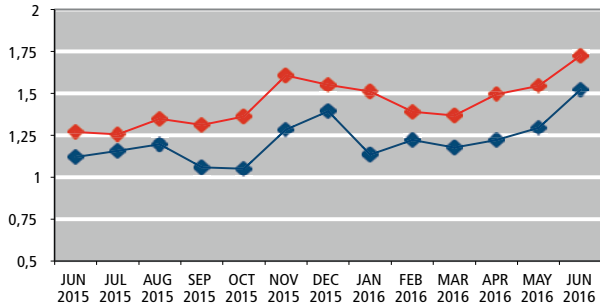
Pineapple Juice Concentrate

65 °Brix, \$/kg



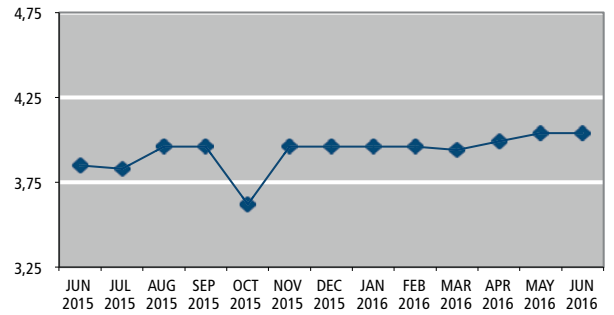
**Orange Juice Concentrate**

Future Markets \$/lb. ◆ = highest values ◆ = lowest values



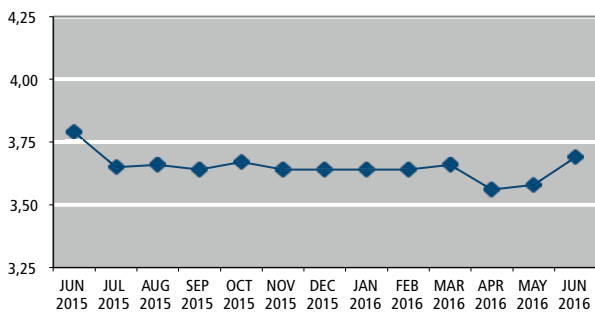
**Lemon Juice Concentrate**

cloudy, 400g/l acid, \$/kg



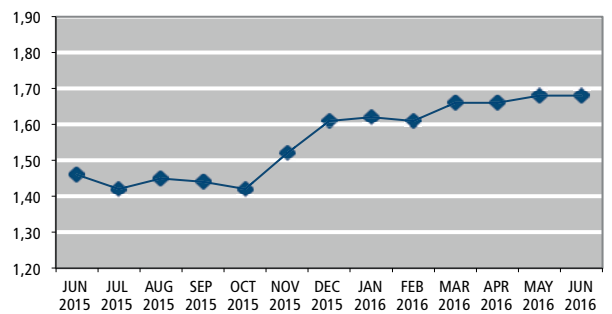
**Grapefruit Juice Concentrate**

58 °Brix, \$/kg



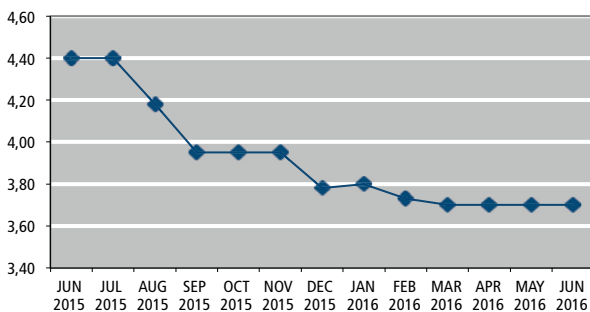
**Pear Juice Concentrate**

65 °Brix, EUR/kg



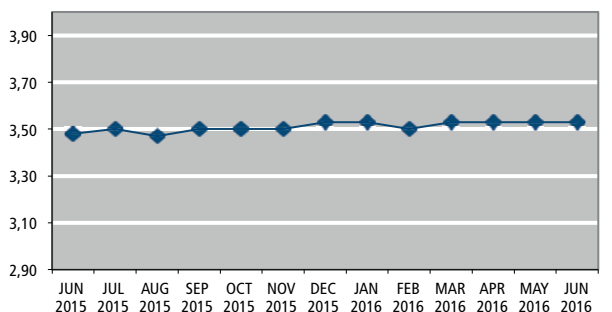
**Sour Cherry Concentrate**

65 °Brix, EUR/kg



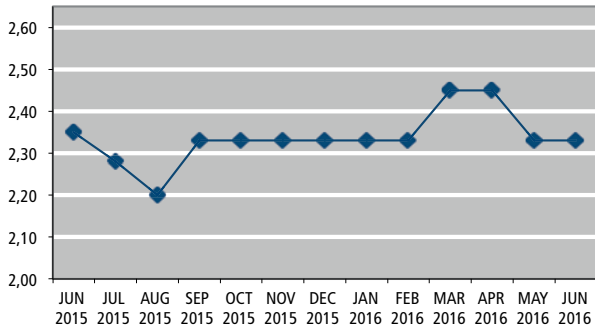
**Black Currant Juice Concentrate**

black, 65 °Brix, EUR/kg



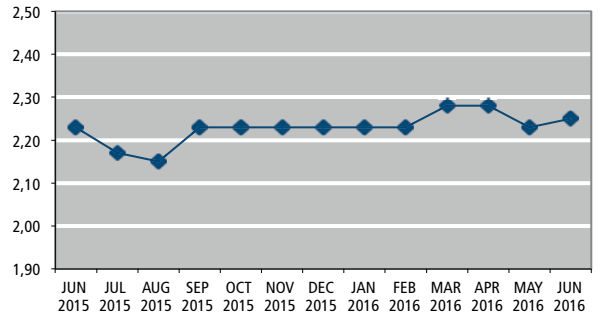
**Grape Juice Concentrate**

white, 65 °Brix, EUR/kg



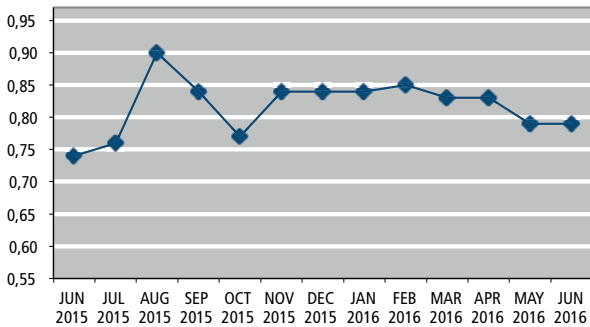
**Grape Juice Concentrate**

red, 65 °Brix, EUR/kg



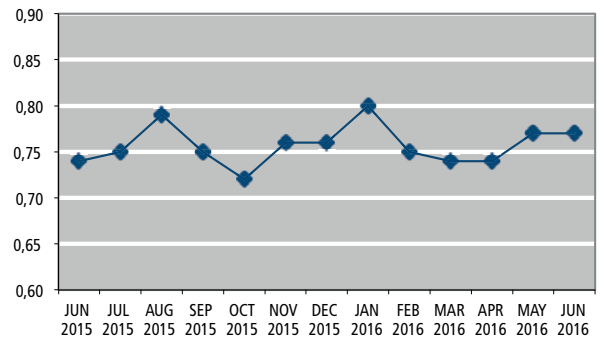
**Apricot Puree**

EUR/kg



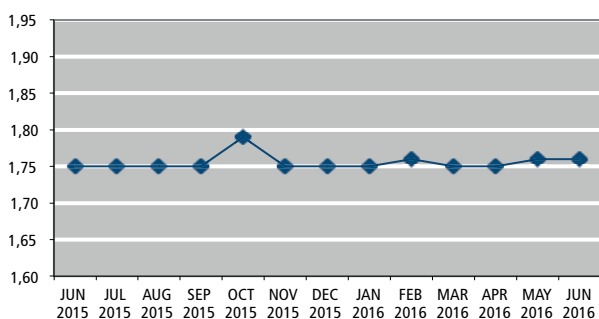
**Banana Puree**

22-24 °Brix, \$/kg



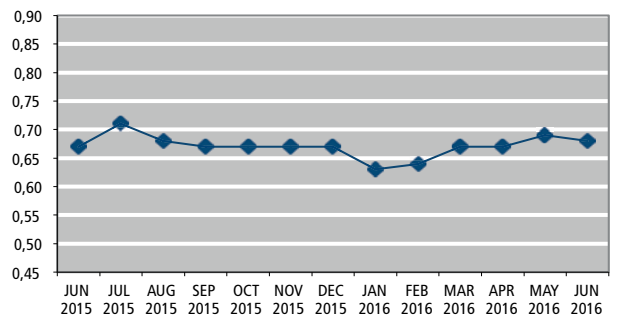
**Mango Puree**

15 °Brix, \$/kg



**Peach Puree**

EUR/kg





# JUICY NEWS HOT OFF THE PRESS

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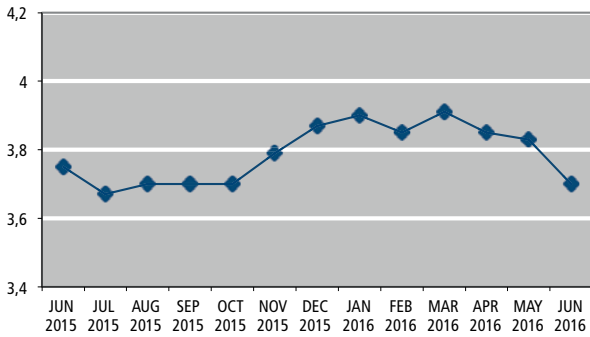
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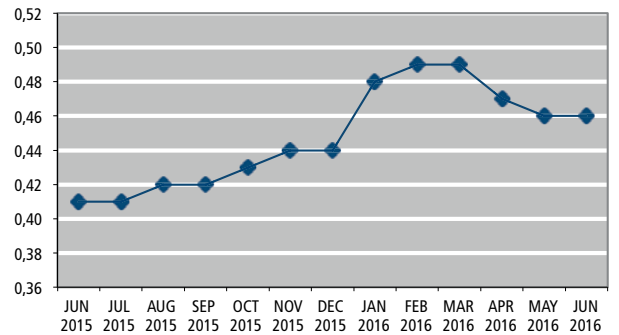


**FRUIT**  
PROCESSING

**Carrot Juice Concentrate**  
65 °Brix, EUR/kg



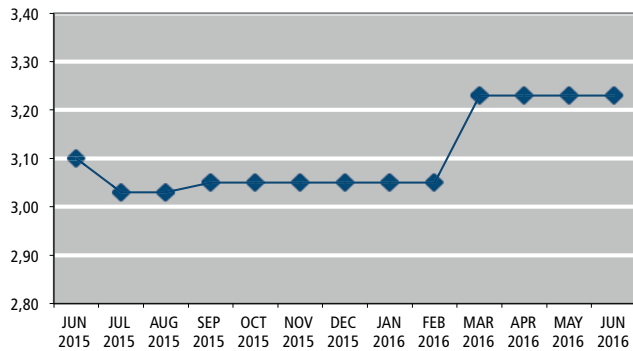
**Carrot Juice**  
EUR/l



**Orange Juice Concentrate**  
organic, 65 °Brix, \$/kg



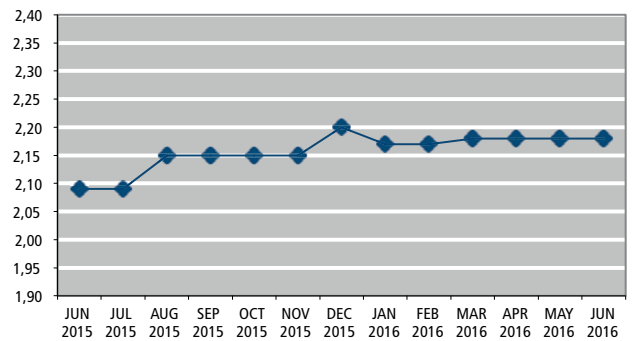
**ORGANIC**



**Apple Juice Concentrate**  
organic, high acidity, 70 °Brix, EUR/kg



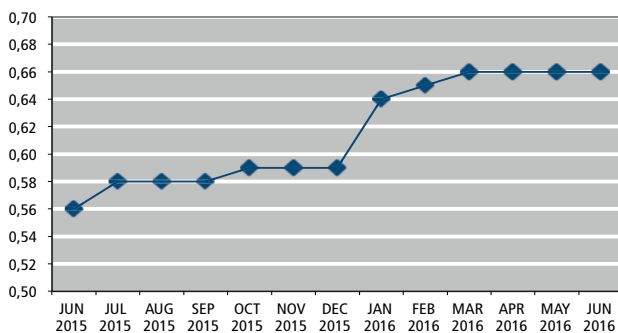
**ORGANIC**



**Carrot Juice**  
organic, EUR/l



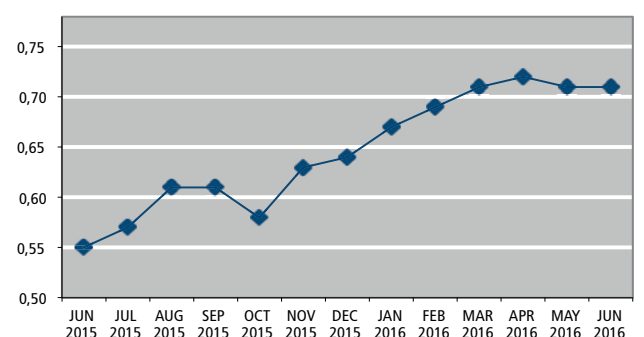
**ORGANIC**



**Red Beet**  
organic, EUR/l



**ORGANIC**

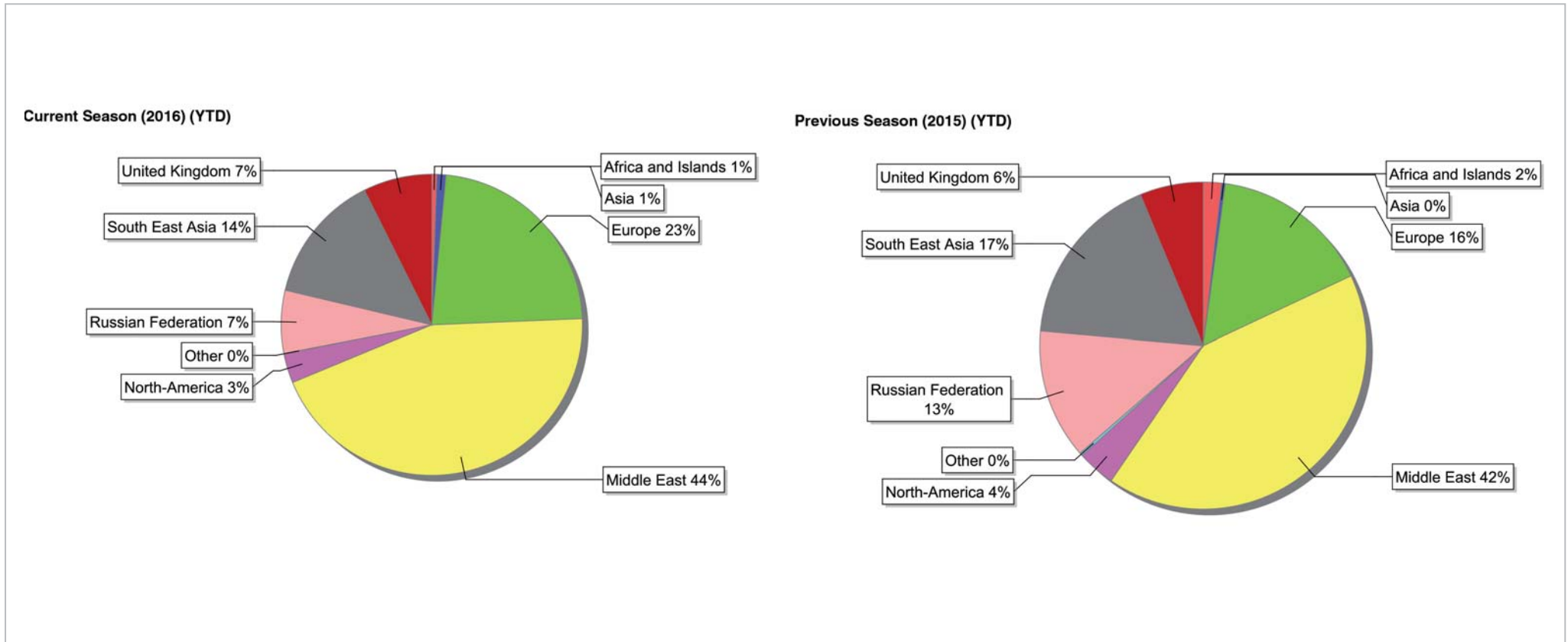




# WORLD OF FRUIT PROCESSING

Market Data – confrica media GmbH

## Lemons (LE): Current Season vs Previous Season



(source: Agri-Hub- 2016)

04/2016/ftp



**NFC FRUIT JUICES, CONCENTRATES & PUREES**  
THE BEST FOR JUICE PRODUCTION



# BEVERAGES: A MARKET ON THE UP

## Any questions?



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**Squeeze us dry like an orange!**

health benefits has sprung into a demand. One of the first products to was the smoothie. Popularised by lon

families alike. Private label ranges the trend, and juice bars devoted smoothies are seeing success. A cen popularity is the all-natural appeal; natives or sugar is a crucial key, mes developed a 100 per cent fruit cranbe the demands of this growing market. and intense red colour, it blends well that cons

verages is main grow alcoholic beverages<sup>5</sup>. According to M restrictions is L natural ingre moved from by consu g for heal

### HEALTHY ALTERNATIVES

business concer tion is a pr will buy a s research, is as an alcohol alternative. I director of insight and innovation at per cent of UK adults would buy a so at a pub/club, and 40 per cent as an the same time, however, adults are le soft drinks. New lines of premium dri natives. Unusual juice blends, sparkl dials provide options beyond the typic

### A SPARKLING FUTURE

In central Europe – Germany, Aust Schorle is a popular refreshing drink. I juice (usually apple) and carbonated w sweet alternative to high sugar carbo also gaining in popularity, typically w ble in a ready to drink form water for the consume gard Apfelschorle as a sum and mineral water market in German worth EUR 634 million, almost 6 % drinks market<sup>6</sup>. Similarly, fr EUR 1426 million in 2009.