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## TOPIGS and Norsvin Merge into Topigs Norsvin

*The world's most innovative swine genetics company*

TOPIGS International and Norsvin International AS have merged their international activities into a new company with the name Topigs Norsvin. The merger of these two companies has resulted in a world-leading swine breeding company with annual revenues exceeding US\$ 179 million / € 130 million. The head office will be in Vught, the Netherlands. TOPIGS Nederland, Varkens K.I. Nederland and Norsvin SA are not part of the merger.

TOPIGS and Norsvin are farmer owned, with an identical philosophy of paying dividends through genetic progress from applied research and development (R&D). Farmer owned meat processors and a feed supplier are minority shareholders.

TOPIGS and Norsvin are aligning their R&D activities for more and smarter investments to accelerate genetic progress and develop new products. TOPIGS and Norsvin have cooperated successfully on selected R&D projects for many years and are now fully aligning all R&D activities. The combined R&D budget is about US \$25 million / € 18 million, equaling 14% of the revenues. The combination of high-throughput phenotyping, large-scale computer tomography of boars, global nucleus breeding, massive gathering of production data, and genomic selection will accelerate genetic progress and add value to the entire production chain.

Topigs Norsvin has a complementary product portfolio with increased value to customers. The current products of both merging companies will remain available. "Results from new, combined products are so promising that we can see that

these will have a global benefit. Topigs Norsvin's strategy involves excellent support through local presence based on individual customer needs. Together we have the people, products and knowledge to offer this better than anyone else," says Bjarne Holm, Chief Development Officer of Topigs Norsvin.

"TOPIGS and Norsvin are a perfect match," states CEO Martin Bijl of Topigs Norsvin. "We are both R&D driven and have complementary portfolios. TOPIGS brings robust, easy to manage lines providing the best total feed efficiency. Norsvin brings extremely productive, lean and efficient lines. Also the market position is complementary with TOPIGS' global presence and Norsvin's solid presence in Scandinavia, the US and the Baltic region."

With a production of more than 1.55 million crossbred gilts and over 8 million doses of semen per year, Topigs Norsvin [www.topignorsvin.com](http://www.topignorsvin.com) is one of the biggest swine genetics suppliers in the world. Each year more than 90 million slaughter pigs are produced with Topigs Norsvin genetics.

Both TOPIGS and Norsvin are renowned for their innovative approach to implementing new technologies and a continuous focus on cost-efficient pig production. Research, innovation, and dissemination of genetic improvement will be the cornerstones of the new company. Continuous and strong product improvement will enable clients to achieve significant added value in their production.



## Under the Surface of a Pig

**Topigs Norsvin's Computer Assisted Tomography technology provides data which greatly increases the accuracy of genetic improvement**

Norsvin implemented CT-scanning of live boars in 2008. Since then, over 19,000 pedigreed animals have passed through the X-ray tube. Implementing CT in the Norsvin genetic program was a crazy concept in Norwegian agriculture, and a highly ambitious project. Looking back on these years, we can for sure call it a success story. Why?

In the Norsvin genetic program, potential AI boars are tested at the high technology test station **Norsvin Delta**. This includes both the maternal line, Norsvin Landrace, and the terminal line Norsvin Duroc. One hundred boars per line are selected as Elite AI boars. Additionally, these animals then have phenotypes from FIRE (feed intake recording equipment), highly detailed exterior scoring and the Norsvin meat quality platform. Currently, all animals off-tested using CT are genotyped using a 60K SNP-chip.

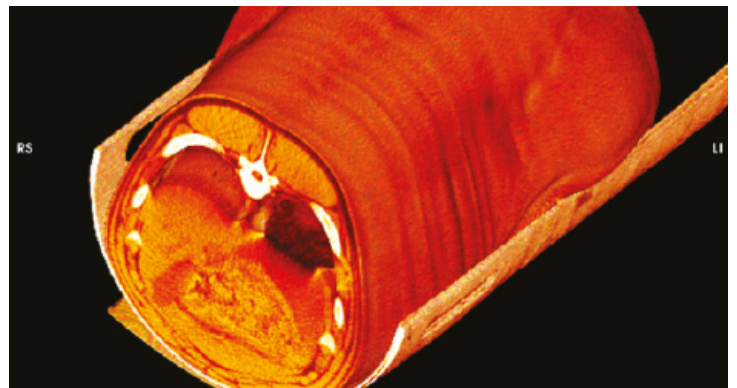
**The CT-scanning alone generates a tremendous amount of data: 1,100 images per animal, 1 image for every 0.05 inches. This equals to approximately 500 MB data per animal.**

Computed tomography (CT) is a non-invasive measuring method where an X-ray source and detector are rotated around the object (tomography) and the signals are reconstructed by a computer to form digital images. These images can be stacked and used to present the object in different planes. Since CT is a non-invasive method of measuring, you can use this method to obtain information about the inside of a closed object without destroying or opening the object. This is the preferred method when measuring on live objects, such as boars for selection in breeding.

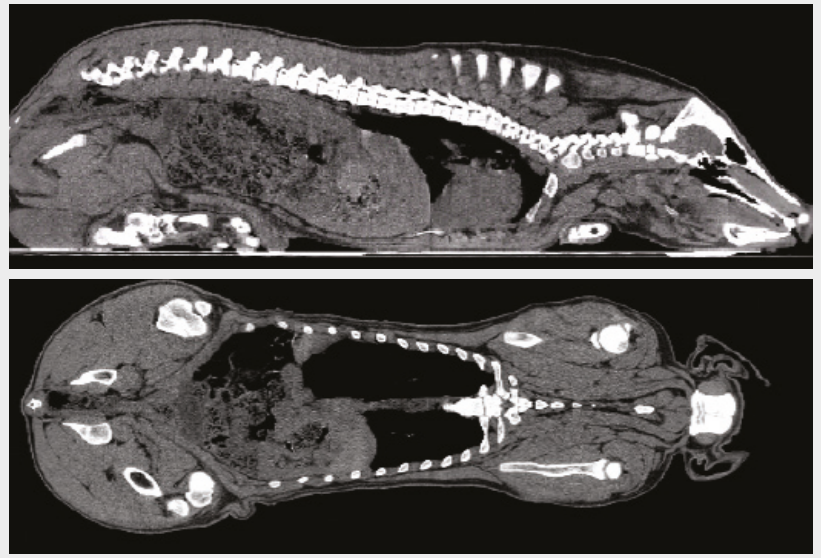
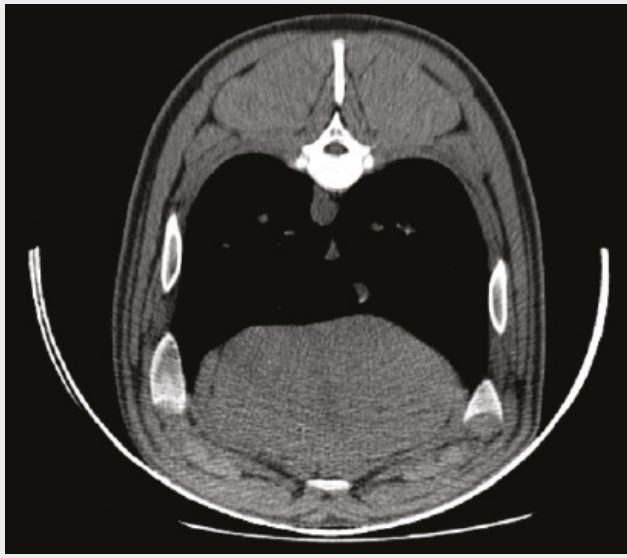
CT is based on the attenuation of X-rays in different tissues or objects. The attenuation of X-rays is related to the density of the tissue or object, i.e. bone tissue with high content of dense minerals will absorb more X-rays compared to fat tissue, which is lower in density. We use this attenuation of X-rays to produce digital images, where each pixel represents the average attenuation of X-rays in the pixel square. In the images, which are usually presented as gray scale images (black to white), high



The Computed Tomography (CT) Device.



Spiral scan of a boar, 1100 slices.



CT images in different anatomical planes. The object is a live boar at 220 lbs. Transverse, sagittal and coronal place.

density tissue will have a light gray or white color, while lower density tissues will have a darker gray color. These differences in gray scale are used to classify the different tissues, and to estimate the composition of an object, such as the lean meat content of a pig. By using the texture or variation in pixel gray values, we can also use this information to obtain measures of meat quality and bone structure.

Topigs Norsvin focuses on the following three fields of study using CT to better understand their genetic products:

### 1. Estimation of body composition

Traits like lean meat percentage, killing-out percentage, yield of bacon and other primal cuts are studied. This is based on a fully automatic method which computes and estimates the composition based on images in different planes and classification of tissues.

### 2. Estimation of meat quality

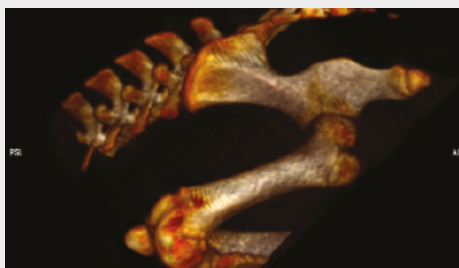
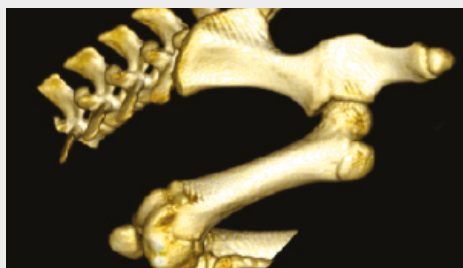
Traits like intramuscular fat and the level of saturation of fatty acids based on texture in lean meat and fat tissues are also measured with CT. Accurate measure of these traits is more challenging, limited by differences in density, pixel size and movement of animals during scanning (noise).

### 3. Robustness/health/veterinary diagnostic imaging

These traits are obtained by a more traditional approach, using experience from human diagnostic imaging. Exterior traits and lameness are examples of traits which can be improved by using CT and diagnostic imaging.

#### CT increases annual genetic gain for sow performance and robustness

Using CT helps Topigs Norsvin to focus on broad, long term and sustainable breeding goals and genetic improvement for our customers. One result of the high accuracy using CT is a higher heritability for CT measured traits. In addition, having the phenotypes on the selection candidate itself has made it possible to reduce the relative weight on carcass quality in the breeding goal while obtaining an even higher annual genetic progress. This has an indirect effect on the other traits as well, especially low-heritable traits like robustness, reproduction and maternal ability, enhancing annual progress for these traits.



3D representation of the back leg and pelvis. Different gray value intervals as selected (windowing). The image to the left shows a wider gray value window, and we observe variation in color which is related to the density of bone and cartilage. These are measures which might help describe the strength and condition of the pig legs.



3D image of bones in the pelvis area. Spinal column (top), pelvis (left) and last ribs (right).





Paradise Valley Genetic Nucleus

In November 2008, TOPIGS bought the Maple Leaf genetics division and part of that purchase included Paradise Valley, a 750 sow Genetic Nucleus. Although TOPIGS already had nucleus farms in Manitoba and Saskatchewan that were well established, it was evident that an additional, larger nucleus was required. In early 2009, planned matings of the best maternal TOPIGS N & Z line genetics were done to prepare for the transfer of TOPIGS genetics into Paradise Valley.

With the planned matings complete, the process of moving TOPIGS genes into Paradise was implemented over two large C-section projects. The high genetic merit "in-pig" sows of the required lines were housed off site until their time to farrow. On the due to farrow date, the piglets were removed from the sows via caesarian section and moved, following strict bio-security and health protocols, directly into Paradise Valley onto the waiting foster sows. These piglets were to become the foundation TOPIGS seed stock for North America and the world.

Over the next several years the original genetics were culled while the TOPIGS N & Z line populations were expanded to the full capacity of a 750 sow herd. TOPIGS genetic programs and protocols were put into place to ensure only the best genes were retained.

Being the best Genetic Nucleus in the world doesn't happen overnight. Under the management of Randy Schultz (Production Manager) and assistance from Justin Reimer (Genetics Manager), the team effort of a diligent and capable staff at Paradise Valley has made all the difference in rising to the top. They have focused on making Paradise Valley a world class Genetic Nucleus by implementing the program and protocols required from TOPIGS, collecting huge amounts of highly accurate data, and making selection decisions based on reliable information to move the genetic program forward.

## Producer PROfile - Paradise Valley Topigs Norsvin Genetic Nucleus

Some of the protocols used:

- Piglet weighing protocol, piglet survivability
- Testing and selection program: t-start, t-medium, t-end
- LMS (live muscle scanning)
- On farm semen collection
- FARM data collection
- IFIR (Individual Feed Intake Recording) using IVOG feeders
- Imported fresh and frozen semen
- DNA collection for genomics

All of these protocols create performance results that link to the large TOPIGS database of more than 28 million pig records to ensure the performance of future generations is highly predictable.

The result is that today Paradise Valley is a Genetic Nucleus that is one of the top genetic merit farms within the Topigs Norsvin system worldwide. Some of the top boars reside here in North America and become available to Topigs Norsvin customers around the world. Paradise Valley supports the Topigs Norsvin genetic structure across Canada, through the US and into Mexico. Live pigs and semen are also being exported to South America, Asia and Europe.



Paradise Valley Staff

# Topigs Norsvin LZ 70 Parent Female

In January 2012, Norsvin SA and TOPIGS agreed to import TOPIGS Z-line (Large White) from the Netherlands into Norway for crossing with the Norsvin Landrace to make a new commercial parent gilt, the LZ 70. Protecting the biosecurity of the Norwegian swine herd was of primary importance, but strict importation protocols and extensive veterinary testing resulted in a successful importation and the LZ 70 is available to Scandinavian producers today.

The Norsvin Landrace has never been influenced by other genetics. Due to this strong genetic profile, Norsvin Landrace has repeatedly demonstrated an increase in total profit when introduced as a component to other genetic programs. Semen is now available for customers in North America to make the LZ 70 internally and future multiplication will include this new product combination.

## Breed Characteristics

### NORSVIN L-line

For the last 20 years, Norsvin Landrace has been bred in terms of combining terminal efficiency and productivity with being a dam line. Through that, Norsvin Landrace is unique in its contribution of productivity, efficiency and carcass quality to the market hog, while being prolific with an outstanding weaning ability.

### TOPIGS Z-line

This TOPIGS Large White is characterized by high daily gain, robust structure and superior total feed efficiency. The TOPIGS Z-line is a perfect complement to the Norsvin Landrace. It promotes high piglet viability, uniform piglets and reproductive and maternal traits are combined with productive market hog traits.

**NORSVIN L-Line x TOPIGS Z-Line**



**Topigs Norsvin LZ 70**



## The Topigs Norsvin LZ 70 Parent Female

A unique combination; balancing prolificacy, efficiency and productivity.

- Topigs Norsvin LZ 70 gives the market hog a unique genetic combination to efficiently produce high lean meat yield.
- Topigs Norsvin LZ 70 provides superior productivity in both total pigs born and total weaned, while achieving excellent uniformity and high weaning weights.
- Topigs Norsvin LZ 70 presents an outstanding structure, including superior underline quality.
- Selected for decades to handle loose housing and long lactation length.

## Topigs Norsvin Canada

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### Canada

#### AI Stud Stations

#### Magnum Swine Genetics Inc.

Fort Macleod, AB  
Andrew Buesekom  
(888) 553-4844

#### Carlo Genetics Inc.

Ste. Anne, MB  
George Goossen  
(204) 355-4012

#### Total Swine Genetics Inc.

Tillsonburg, ON  
Stuart De Vries  
(800) 844-9913

#### C & M Genetics

Lucan, ON  
Dr. Corneliu Oltean  
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#### Sunrise Genetics

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Doug Peterson  
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#### Mar-Ke Semen Service

Sharon, WI  
Keith & Marie Rithamel  
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#### Dutch Sires

New Carlisle, OH  
Stacey Voight  
(937) 313-1138

#### Ai Partners

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Bruce Zierke  
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#### LoMill Farms

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Larry Miller  
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## Topigs Norsvin Insider Quiz

### How to Play

Please answer the questions in our Insider Quiz. All the answers are in this newsletter. Then fax, mail or email your answers, along with your name, address, and phone number. Entries are to be received by October 31, 2014. Winners will receive a \$20.00 Walmart Gift Certificate and the Topigs Norsvin rep in your area will deliver the prize. Employees of Topigs Norsvin and their subsidiaries are not eligible.

What is the Topigs Norsvin combined R&D budget in US dollars? \_\_\_\_\_

How large is the sow herd at the Paradise Valley Genetic Nucleus? \_\_\_\_\_

How many images are generated from the CT-scanning of one pig? \_\_\_\_\_

How many pedigreed animals have passed through the CT-scanner since 2008? \_\_\_\_\_

Name: \_\_\_\_\_

Farm Name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone #: \_\_\_\_\_

### Topigs Norsvin INSIDER Quiz Winners

Here are the winners from the last issue: Lawrence Waldner, Wellwood Colony, MB; Wayne Brubacher, Westlane Acres, ON; Marilyn Tschetter, Oakridge Colony, MB; Philip Hofer, James Valley Colony, MB; Adam Waldner, Upland Colony, SD; Steven Kleinsasser, Big Bend Farming Co, AB; Kevin Wurtz, Horizon Colony, MB; Nigel Waldner, Grass River Colony, MB; Glenda Tschetter, Pleasant Valley Colony, SD; Gideon Wurz, Bench Colony, SK.

Each winner receives a \$20.00 Walmart Gift Certificate. The Topigs Norsvin rep in your area will deliver your prize. Congratulations!

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