



Centre de  
développement du  
porc du Québec inc.

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***SWINE STATION TEST PROGRAM (SSTP)  
SPECIFIC PROTOCOL FOR TESTS TO BE CONDUCTED IN NOVEMBER 2009 AND MAY  
2010 (# 27 AND 28) PUREBRED SWINE TEST***

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## **1. TITLE**

Development of new genomics tools for swine genetic improvement

## **2. OBJECTIVE**

General objective:

Assess the practical applications of genomic selection in Canadian swine for the improvement of different economically important traits, more specifically traits related to meat quality.

Specific objectives:

- Use new available technologies in genomics (SNP panels « single nucleotide polymorphism » or SNP chips) to establish the genotype of pigs in station;
- Study the association of SNPs with different traits evaluated on pigs during the tests in different breeds and lines;
- Develop methods to include genomics in breeding value estimations;
- Develop a DNA Bank along with the phenotypical performances recorded on pigs in station;
- Submit recommendations for the use of SNP panels in selection of pigs in Quebec and Canada.

## **3. METHODOLOGY**

### **3.1 Description**

Several swine breeders or breeding organizations will have the capability of simultaneously assess, at the Deschambault test station, purebred swine. Different data will be collected as part of this project, including growth traits, individual feed consumption by animals, carcass quality, primal meat cuts as well as meat quality (see Appendix 1).

The Deschambault test station is equipped with a computerized feeding system that allows the measurement of feed consumption of each pig at the station. The time and the precise length of each pig's visit at the feeder are recorded. These continuously recorded data will not only assess the actual consumption of pigs but also their feeding behaviour.

Purebred **Yorkshire, Landrace and Duroc castrates** will be evaluated during tests 27 and 28, which will take place from November 2009 to April 2010 and from May to October 2010.

### **3.2 Inseminations**

Breeders participating in the tests have to complete purebred inseminations from **July 3<sup>rd</sup> to July 16<sup>th</sup>, 2009** and from **January 13<sup>th</sup> to January 26<sup>th</sup>, 2010** inclusively for piglets to enter the station on the two trials (see calendar in Appendix 2)

It is recommended that breeders maximize the diversity of boars used for insemination in order to obtain a suitable genetic representation of the breed in castrates introduced in to the station.

Participating breeders must also provide a DNA sample of boars used for inseminations at the time of the insemination. Additionally, it is strongly recommended that breeders provide DNA samples of sows serviced for the tests at the time of the farrowing. The shipment protocol of DNA samples for boars used or for the dams (sow serviced) will be described later.

### **3.3 Piglets**

#### ***3.3.1 Piglet sorting***

The breeder or any other authorized personnel within an organization will select the castrates. CDPQ reserves the right to select litters to maximize the genetic diversity of castrates entering the test station. A maximum of **two castrates** will be selected per litter. The piglets will have to be **10 to 16 days old** at the time of entering the test station (the farrowing date being day 0) and weigh at least 3 kg<sup>1</sup>. The piglets should not show any clinical signs of contagious diseases, have castration and tail docking wounds that are healing well and have no evidence or problems with stance (arthritis) or hernias.

#### ***3.3.2 Piglet Identification***

All castrates born in selected litters have to be identified at birth by a tattoo or a tag according to CLRC's rules.

#### ***3.3.3 Transportation of Piglets***

All piglets will enter the station on two specific dates one week apart, on two consecutive Wednesdays for test 27 (November 11<sup>th</sup> and 18<sup>th</sup> 2009) and two consecutive Mondays for trial 28 (May 24<sup>th</sup> and 31<sup>st</sup> 2010). The producer will transport only the pigs selected in his herd with a vehicle of his choice that has been disinfected and cleaned prior to transport of piglets to a designated location for pick-up by CDPQ employees. Piglet transportation, from the point of collection to the Deschambault test station, will be carried out by CDPQ employees using trucks that have been reserved for this purpose for farms in Quebec. For herds outside of Quebec, breeders will have to transport piglets to the Deschambault test station or coordinate the transport with a regional centre.

### **3.4 Herd Eligibility Requirements**

- When requesting to participate in the tests, the herd in question has to be regularly followed by a veterinarian for at least six (6) months. The veterinarian responsible for following up will have to submit information documenting the absence or prevention protocols for the diseases outlined below :
  - Transmissible gastroenteritis (GET)
  - Porcine Reproductive and Respiratory Syndrome (PRRS)
  - Enzootic pneumonia
  - Atrophic rhinitis
  - Pleuropneumonia
  - Dysentery
  - Sarcoptic mange
  - Exudative Epidermitis
  - Glasser's disease
  - Diseases related to *Streptococcus suis* (meningitis, etc.)

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<sup>1</sup> For high health status herds and according to certain criteria to be defined, the upper age limit of piglets entering the station (16 days) can be increased.

The supplied information will be analyzed by a veterinarian at CDPQ. The veterinarian will decide on the eligibility of the herd to participate and will inform breeders of reasons for refusing participation in the tests;

- Has to be an accredited member of the Canadian Quality Assurance Program (CQA);
- During two weeks prior to the beginning of the test, the breeder and the veterinarian responsible for follow-up on the herd will have to attest the absence of clinical signs of prejudicial diseases in maternity and the nursery. Particularly, no clinical signs of the following diseases should be present:
  - Transmissible gastroenteritis (GET)
  - Porcine Reproductive and Respiratory Syndrome (PRRS)
  - Exudative Epidermitis
  - Glasser's disease
  - Symptoms related to *Streptococcus suis* infection (meningitis, etc.)
  - Atrophic Rhinitis
  - Pleuropneumonia

**Note :** *Selected farrowing units in herds will ideally have facilities and management practices that allow the restriction of indirect and direct contact between newborn piglets and older piglets (ex. Maternity in compartments, all in/all out batch management, early weaning etc.)*

### **3.5 Allotment**

#### ***3.5.1 Acclimatization period (nursery)***

At their arrival, the piglets will be weighed individually. The allotment is completed according to piglet weight and health status. Forty-eight (48) pens are available and each pen can accommodate seven (7) to eight (8) piglets (4.0 to 4.6 sq. ft. / piglet). The length of this phase is approximately 50 days.

#### ***3.5.2 Test Period (Grow-Finish phase)***

Pigs, when transferred from the nursery to the grow-finish phase, will be placed in 28 pens with a capacity of 13 pigs per pen (10.5 sq. ft. / pig). The allotment of pigs per pen will be completed according to the weight of the pigs. The weight targeted at the end of the tests is **120 kg**.

### **3.6 Animal Identification**

#### ***3.6.1 Acclimatization Phase (nursery)***

During this phase, a tag with a unique and permanent number will be placed on the ear of piglets up to the slaughter. A correspondence system will also assure the traceability of the permanent number back to:

- The number given to the animal in the herd of origin;
- The electronic identification number in the test period (grow-finish phase);
- The tattoo number given to the animal when it exits the test station for the slaughterhouse.

#### ***3.6.2 Test period (Grow-Finish phase)***

At the time of transfer to the grow-finish phase, each pig will be given an electronic ear-tag (transponder) in order to allow individual feed consumption to be monitored using the Insentec feeding system.

## **3.7 Feeding**

### ***3.7.1 Acclimatization Period (Nursery)***

Four feeding phases are anticipated during the acclimatization period with cube textured feed (Appendices 3 and 4). The feed will be bought from a chosen company based on a submission process. The first three feeds will be defined by the supplier whereas the fourth feed will have to meet the need the nutritional constraints defined by the CDPQ (Appendix 4). The supplier will have to give a precise feeding program including:

- The different phases;
- The guidelines related to phase feeding and instructions related to feed transition;
- Medications that will be used according to the specifications of the CDPQ.

Feeding consumption measures in the nursery will be calculated for all piglets and not on an individual basis. Refusals will be assessed and dead animals will be included in the consumption calculations.

### ***3.7.2 Test Period (Grow-finish phase)***

Piglets will be transferred into the grow-finish section approximately one week before the beginning of the test in order to allow piglets to acclimatize to their new environment and to the individual feeding system.

After the transfer, piglets will be fed with the fourth feed used in the nursery for two to three days and then fed the first feed of the test period up to the beginning of the official start of the test.

Three feeding phases are anticipated for this period with cube textured feed (Appendix 4). Feed samples from each batch delivered will be sampled and sent to a laboratory for analysis. The consumed feed is recorded by animal and by visit for the entire test. The feeding program and feed components will be defined by the CDPQ Nutrition-Feeding Advisory Committee. The Nutrition-Feeding Advisory Committee includes several specialists from universities and the swine industry.

## **3.8 Health management**

### ***3.8.1 Acclimatization Period (Nursery)***

Before piglets enter the nursery, the station will be empty for approximately two weeks during which the whole station will be cleaned and disinfected. The station batch management follows an all in/all out protocol.

During the acclimatization phase, the piglets will receive the necessary medications to prevent certain bacterial and parasitic infections. All piglets will receive a vaccine against *Mycoplasma hyopneumoniae* and a vaccine to prevent circovirus related diseases.

### ***3.8.2 Test Period (Grow-finish phase)***

The veterinarian in charge of herd health follow-up will pay regular visits according to a predetermined schedule, in order to assess the health status of pigs and to manage the elimination of pigs with major anomalies. No specific treatment will be given to pigs in the grow-finish section except for specific cases arising during the test. Additionally, no antibiotics will be used in prevention of disease or as growth factors.

In case of mortality, necropsies will be completed on the pigs by the CDPQ veterinarian or by MAPAQ's laboratory of animal pathology. Serological tests can be carried out during the test.

### **3.9 Fasting**

The day before slaughter, all selected pigs will be weighed and have feed restricted. The total length of fasting, including a minimum resting period of three (3) hours at the slaughter house, will be 16 to 20 hours. Pigs will be sent to the slaughter house once a week and slaughter will take place over a six (6) week period.

### **3.10 SNPs Genotyping**

DNA Landmarks' expertise will be used to carry out genotyping of SNPs from DNA samples. DNA Landmarks is a company specialized in molecular markers and genetic mapping for the agriculture and agri-food industry. Genotyping of SNPs will be completed using a new porcine SNP panel which includes 60 000 SNPs. This newly available technology is available since January 2009. For each animal, one DNA sample and a SNP Chip will enable us to identify the results of 60 000 SNPs.

### **3.11 Performance and Genomic (SNP) Data Analysis**

This step will consist in establishing a link between performances recorded in station and the genetic sequence of pigs to predict the genetic value of an animal. The methods used in the analyses of this data were mainly developed for the bovine and poultry industries and they will be applied to the data collected during the project. The potential practical applications include genomic estimated breeding values (instead of breeding values estimated through quantitative genetics), the development of smaller SNP panels (ex : 300 SNPs) for the selection of specific traits (ex: SNP panels for the improvement of meat quality), identification of SNPs which explain a high proportion of trait variability or new approaches to improve genetic diversity. The methodology directly related to the swine industry will be developed over the course of the project and the Canadian Centre for Swine Improvement (CCSI) is the organization that will coordinate these analyses.

#### **4. DEFINITION OF ENROLMENT RULES FOR PARTICIPATING BREEDERS**

Participating breeders will have to specify when signing up an approximate number of castrates per breed that they are willing to provide (forms 1 and 2). If the number of piglets is higher than the available station capacity, CDPQ reserves the right to accept or refuse enrolments according to the following rules:

1. Favour breeders in order to reach a balanced proportion of the three breeds<sup>2</sup> (Yorkshire, Landrace and Duroc) at the time of enrolment for both tests.
2. Favour breeders that are enrolled in the Canadian Swine Improvement Program and swine breeders from Quebec.
3. Favour the participation of numerous breeders (limit the number of piglets provided per breeder if necessary)

Enrolment and declaration on the number of castrates provided will have to be completed prior to the insemination of sows for the test, before May 31<sup>th</sup>, 2009 and November 30<sup>th</sup>, 2009.

#### **5. PUBLICATION OF RESULTS**

Participating breeders will receive individual raw performance results for each castrate included in the test.

In order to inform participating breeders of the analyses that were carried out, the results obtained and to ensure the preservation of their anonymity, CDPQ is committed to respecting the following 3 rules:

- Not to release any results that would allow the identification of specific genetic lines or participating breeders.
- Inform all participating breeders of the analyses conducted on DNA samples (castrates at the test station, sires, dams) other than the analyses outlined in this protocol.
- Provide all participating breeders with the published results of DNA tests (castrates at the test station, sires, dams) and performances measured on castrates at the station including any analyses described or not in this protocol.

All results obtained from SNPs chips, the performances during the trials and analyses will be shared between CDPQ and CCSI.

In addition to the writing of a final report and the presentation of results to researchers in the swine genetics sector, a greater significance will be given to the diffusion and dispersion of results among purebred swine breeders. Very practical applications can arise from this project and to accelerate the use of this new approach in swine selection, it is imperative that breeders understand these new applications of genomics.

<sup>2</sup> Breeders not enrolled in the Canadian Swine Improvement Program will have to provide three generations of pedigree information for castrates on test in order to complete the database.

## **6. PROPERTY RIGHT AND USE OF DNA SAMPLES**

A DNA sample will be collected on all castrates entering the test station as well as their sires. Also, we strongly recommend taking a DNA sample from the dams. CDPQ is the owner of these samples and it reserves the right to eliminate samples without consent of the participating breeder. As underlined in point 5, no results will be published which would allow the identification of specific genetic lines or participating breeders. All breeders will be informed of the analyses and the results obtained.

## **7. PARTICIPATION FEES**

No participation fees will be requested from the participating breeders. The participating breeders will contribute the piglets as an in-kind contribution.

## **8. REQUEST FOR PARTICIPATION**

Breeders willing to participate in these tests simply need to fill out Form 1 (Test 27) and 2 (Test 28). The participation request will have to be completed before the insemination of sows for the tests, before May 31<sup>st</sup>, 2009 (Test 27) and November 30<sup>th</sup>, 2009 (Test 28). All participating breeders will have to sign an official participation form confirming their agreement with the protocol and their commitment to the test and to supply the approximate number of castrates declared for expected entry into the station in November 2009 and May 2010. CDPQ will contact participating breeders before the dates of insemination to confirm a minimum number of castrates and to discuss next steps.

**2009-04-08**

## APPENDIX 1 – DEFINITION OF VARIABLES

Variables	Abbreviations (units)	Description
<b><i>Nursery-Growth Performances</i></b>		
Age	Age (d)	Age at the beginning and at the end of the period For the overall period and for each of the feeding phases
Duration	Duration (d)	End date – Start date of the period For the overall period and for each of the feeding phases
Weight	Weight (kg)	Weight at beginning and at the end of the period For the overall period and for each of the feeding phases
Average Daily Gain	ADG (g/d)	(Final weight – initial weight) / number of days For the overall period and for each of the feeding phases
Total feed consumption	Feed (kg)	Total quantity to feed consumed for all piglets during the period For the overall period and for each of the feeding phases
Consumption per day*	Consumption/day (kg/d)	Consumption per piglet per day For the overall period and for each of the feeding phases
Consumption per piglet*	Consumption/piglet (kg/piglet)	Total consumption per piglet For the overall period and for each of the feeding phases
Feed conversion on live weight gain*	F.C. live weight gain	Overall consumption for all pens/live weight gain for all piglets For the overall period and for each of the feeding phases
<b><i>Test-Growth Performances</i></b>		
Age at the end of the test	Final Age (d)	Age at the day of shipment to the slaughterhouse prior to fasting
Duration of test	Test Duration (d)	Date at the end of the test – Date of the beginning of test
Weight at the beginning of test	Initial Weight (kg)	Weight at the beginning of test
Weight at the end of the test	Final weight (kg)	Weight on the day of shipment prior to fasting
Average Daily Gain	ADG (g/d)	Final weight – Initial weight / number of days of presence For the overall period and for each of the feeding phases
Backfat thickness	Backfat (mm)	Backfat thickness measurement between the 3 <sup>rd</sup> and 4 <sup>th</sup> last ribs on the live animal (at 50, 75 and 120kg) with an ultrasound machine (mode B)
Lean Depth	Lean depth (mm)	Loin lean depth measurement between the 3 <sup>rd</sup> and 4 <sup>th</sup> last ribs on the live animal (at 50, 75 and 120kg) with an ultrasound machine (mode B)
<b><i>Conformation</i></b>		
Teat Assessment	Number	Total number of teats, functional teats, inverted, necrotized and intercalar teats
Assessment of feet and legs	Subjective score from 1 to 5	Subjective assessment of feet and legs according to the national scoring system for feet and legs
<b><i>Feed Efficiency Performances</i></b>		
Total consumption per pig	Total Consumption (kg)	Total feed consumption during the test
Daily feed consumption per pig	Consumption/days (kg/d)	Total feed consumption / duration of the test For the overall period and for each of the feeding phases
Feed conversion on live weight gain	F.C. live weight gain	Feed consumption of a pig / live weight gain For the overall period and for each of the feeding phases
<b><i>Carcass Yield</i></b>		
Hot carcass weight	Hot weight (kg)	Hot carcass weight after bleeding and evisceration with head, tongue, leaf fat, kidneys, jowl, feet and no trimmings
Carcass yield	Carcass Yield (%)	(Hot carcass weight / Final live weight at the end of the test) x 100
Backfat thickness	Destron Backfat (mm)	Backfat measurement between the 3 <sup>rd</sup> and 4 <sup>th</sup> last ribs on the carcass with a Destron-like probe
Loin lean depth	Destron Lean Depth (mm)	Loin lean depth measurement between the 3 <sup>rd</sup> and 4 <sup>th</sup> last ribs on the carcass with a Destron-like probe
Lean yield	Lean Yield (%)	Carcass lean yield calculated from the prediction equation established by Agriculture and Agri-Food Canada
Classification index (good stratum)	Average Index	Average Index of carcasses that are in the good stratum of defined weight according to the grading grid in effect

\* : Feed consumption in the nursery will be measured for all piglets and not on an individual basis.



**DEFINITION OF VARIABLES (CONTINUED)**

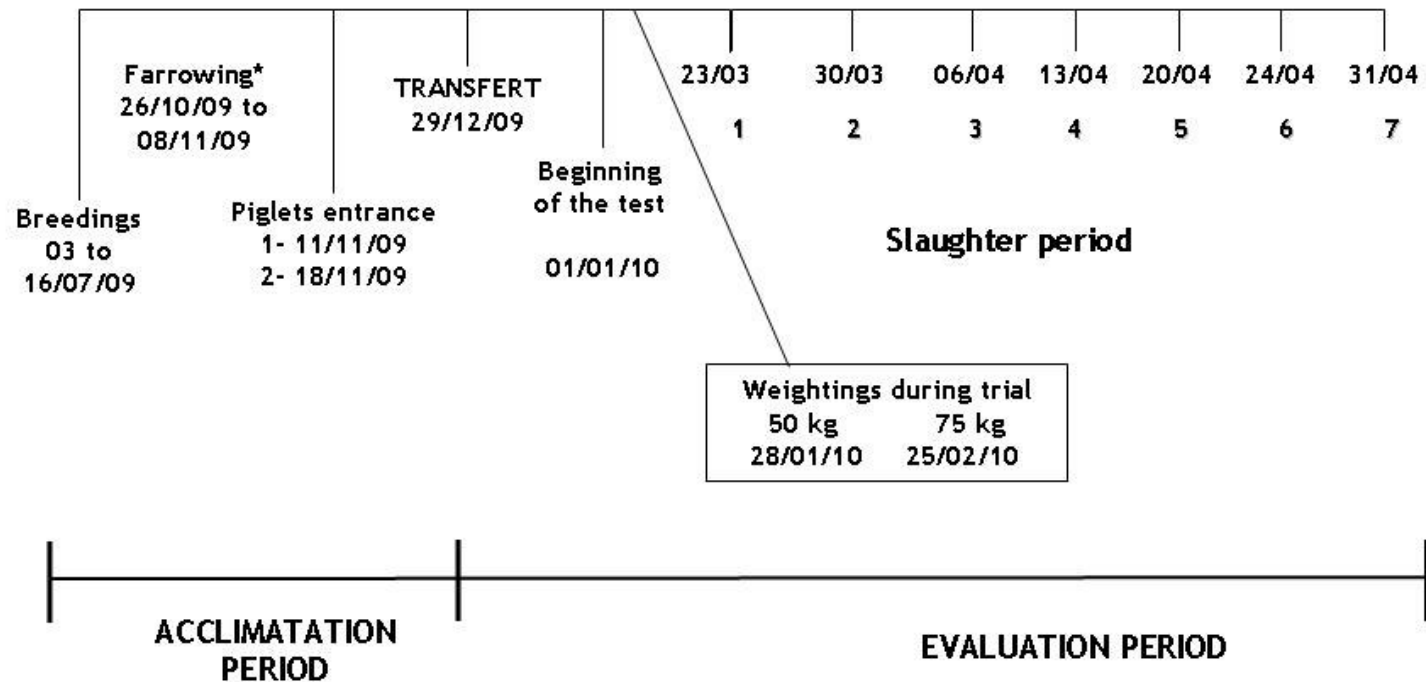
<b>Variables</b>	<b>Abbreviations (units)</b>	<b>Description</b>
<b><i>Primal cut</i></b>		
Half-carcass weight	½ carcass weight recons. (kg)	Half carcass weight reconstituted from the 4 primal cuts (ham, loin, shoulder and belly)
Half-carcass length	Length (cm)	Measure on the head side of the first rib to the anterior part of the pubic bone (Foster rule)
Loin eye area	Loin eye area (cm <sup>2</sup> )	Area obtained using a planimeter
Ham weight	Ham weight (kg)	Cut perpendicular to the inferior part of the leg. Cut line at 4.5 cm (1 ¾ inch) from the anterior part of the pubic bone. Without the hind feet and tail.
Loin weight	Loin weight (kg)	The loin is separated from the belly by a cut which being at the extremity of the shoulder, starts at 4.5 cm (1 ¾ inch) from the base of the ribs, extends to 10cm (4 in) at the center of the loin and ends at the thigh extremity by running alongside the tenderloin at 2 cm (¾ inch).
Shoulder weight	Shoulder weight (kg)	See description of the loin, without the front leg
Belly weight	Belly weight (kg)	See description of the loin
Short hip and ½ carcass ratio	Short hip yield (%)	(Ham weight / Half carcass weight) x 100
Loin and ½ carcass ratio	Loin Yield (%)	(Loin weight / Half carcass weight) x 100
Shoulder and ½ carcass ratio	Shoulder Yield (%)	(Shoulder weight / Half carcass weight) x 100
Belly and ½ carcass ratio	Belly yield (%)	(Belly weight / Half carcass weight) x 100

## DEFINITION OF VARIABLES (CONTINUED)

Variables	Abbreviations (units)	Description
<b>Meat quality</b>		
<i>a. Loin: Measurement on Longissimus dorsi muscle between the 3rd and the 4th last ribs, 24 hours after slaughter</i>		
pH 24h	Ultimate pH	pH measurement at two (2) locations in the loin muscle using a pH meter
Minolta (L*a*b)	Luminosity	L*a*b measurement at two (2) locations in the loin muscle using a Minolta apparatus
Visual Colour Score	Colour	Scores determined by comparison to Meat Colour Samples from the Japanese Colour Scale (1 to 6)
Visual Intramuscular Fat Score measured on the loin	Marbling NPPC	Measure of marbling level according to the scale from Agriculture and Agri-Food Canada (a to e) and/or the NPPC Scale (1 to 10). Average of the measures completed on the anterior and posterior portion of a rib chop
Texture	Texture	Subjective measure carried out by manipulating the meat that is being assessed on a scale from 1 to 3 (1 : Firm, 2: Average, 3: Soft)
Loin drip loss	Drip loss (%)	Measure performed on a muscle tissue sample collected from the anterior portion of the loin and drip dried for 48 hours. (Water loss of muscle / fresh muscle weight) x 100
<i>b. Ham : Measurements taken in different muscles, 24 hours after slaughter</i>		
pH 24 h	Ultimate pH	Measurement taken in the ham at the <i>gluteus medius</i> muscle
Minolta (L*a*b)	Luminosity	L*a*b measurement taken in the <i>gluteus medius</i> muscle with a Minolta apparatus
Visual Colour Score	Colour	Scores determined by comparison of <i>gluteus medius</i> muscle samples to Meat Colour Samples from the Japanese Colour Scale (1 to 6)
Bicoloration	Two toned index	Colour differential observed using the Japanese colour scale between <i>gluteus medius</i> and <i>gluteus profundus</i>
Technological Ham Yield	Tech. Yield (%)	Estimated from a prediction equation where the colour and reflectance variables (L*, a* et b*) of the ham muscles are used. The measures are performed on the <i>gluteus medius</i> and the <i>gluteus profundus</i> muscles.
<i>c. Belly : Overall measurement taken in different muscles, 24 hours after slaughter</i>		
Firmness	Texture	Measurement taken on deboned and not skinned belly in suspension on a metallic stem for two (2) minutes.



**DESCHAMBAULT SWINE TEST TATION  
TEST 27 - NOVEMBER 2009 - CALENDAR**



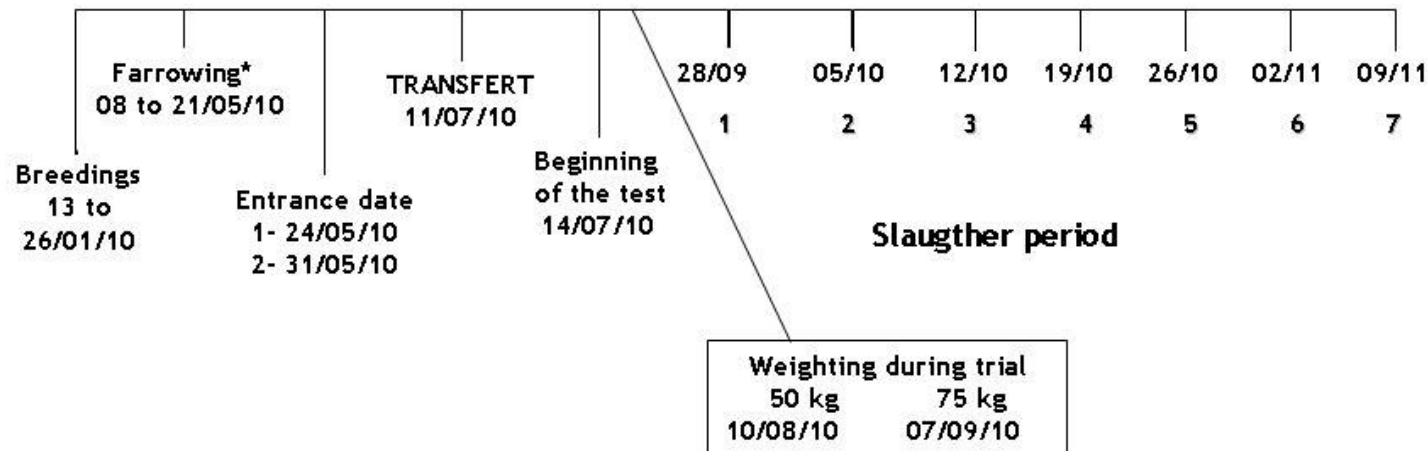
Note :

- Transfert : 1st entrance date + 50 days
- \* Based on a gestation length of 115

- Beginning of growing phase: 1st entrance date + 54 days
- Weighting 50 kg : beginning of the test + 27 days
- Weighting 75 kg : beginning of the test + 55 days



**DESCHAMBAULT SWINE TEST TATION**  
**Test 28 - MAY 2010 - CALENDAR**



Note :  
 Transfert : 1st entrance date + 50 days  
 Based on a gestation length of 115

- Beginning of growing phase: 1st entrance date + 54 days
- Weighting 50 kg : beginning of the test + 27 days
- Weighting 75 kg : beginning of the test + 55 days

**Guaranteed Nutritional Analyses of the first three (3) feeds supplied during the acclimatization period**

<b>General analysis</b>		<b>1<sup>st</sup> feed</b>	<b>2<sup>nd</sup> feed</b>	<b>3<sup>rd</sup> feed</b>
Crude protein (minimum)	%	20.5	19.0	19.0
Crude fibre (maximum)	%	1.6	3.0	3.0
Fibre ADF	%	3.1	3.8	3.8
Fat content (minimum)	%	8.0	5.0	5.0
Calcium	%	1.1	1.0	1.0
Total Phosphorus	%	0.8	0.8	0.8
Sodium	%	0.2	0.2	0.2
Added copper	mg/kg	125	125	125
Added zinc	mg/kg	500	500	500
Added selenium	mg/kg	0.3	0.3	0.3
Added vitamin A	UI/kg	18 000	10 000	10 000
Added vitamin D	UI/kg	1 800	1 000	1 000
Added vitamin E	UI/kg	50	46	46

\*Changes may occur between suppliers.

**Nutritional formulation and specification of feed  
(4<sup>th</sup> feed supplied in the acclimatization phase and test feed)**

	Feed				
	Acclimatization period	Test period			
		4 <sup>th</sup> feed	Start ~ 25 to 50 kg	Growth 50 to 75 kg	Finish 75 à 115 kg
<b>Ingredients per 1000 kg</b>					
Corn	kg	478.88	522.32	598.19	628.90
Soybean meal (48,0 %)	kg	293.00	255.00	213.00	191.00
Wheat	kg	150.00	150.00	150.00	150.00
Fat (animal)	kg	37.00	35.00	5.00	-----
Finely ground Limestone	kg	16.20	15.20	15.20	13.90
Monocalcium phosphate (equiv. 19.0/16.8)	kg	9.40	7.30	4.90	3.70
Copper sulphate 25 %	kg	0.25	0.25	0.25	0.25
Salt	kg	4.50	4.50	4.50	4.50
Lysine (L lysine HCl)	kg	3.50	3.50	3.20	2.60
DL Methionine	kg	1.55	1.25	0.75	0.30
L-Threonine	kg	1.20	1.15	0.60	0.60
L-Tryptophan	kg	0.07	0.08	0.06	-----
Trace elements and vitamin concentrate	kg	3.00	3.00	3.00	3.00
Choline chloride 60 %	kg	0.95	0.95	0.95	0.95
Phytase (500 FTU/1000)	kg	0.50	0.50	-----	-----
Phytase (400 FTU/1000)	kg	-----	-----	0.40	-----
Phytase (300 FTU/1000)	kg	-----	-----	-----	0.30
<b>Total</b>		<b>1 000</b>	<b>1 000</b>	<b>1 000</b>	<b>1 000</b>
<b>Predicted nutritional values (as fed)</b>					
Solids	%	88.63	88.59	88.24	88.16
Crude protein	%	20.65	19.22	17.80	16.94
Digestible energy per pig*	kcal/kg	3 467	3 461	3 324	3 304
Crude fiber	%	3.07	3.04	3.06	3.05
Fat (ether extract)	%	6.08	5.99	3.25	2.84
Calcium	%	0.89	0.80	0.75	0.68
Total copper	mg/kg	93.53	92.71	91.83	91.34
Total phosphorus	%	0.57	0.51	0.45	0.42
Total sodium	%	0.19	0.18	0.18	0.18
Added selenium	mg/kg	0.30	0.30	0.30	0.30
Total lysine	%	1.30	1.20	1.08	0.97
Total Methionine and Cysteine	%	0.82	0.75	0.68	0.61
Total Methionine	%	0.46	0.42	0.35	0.30
Total Threonine	%	0.87	0.81	0.71	0.68
Total Tryptophan	%	0.24	0.22	0.20	0.18
Methionine / Lysine Ratio		0.35	0.35	0.32	0.31
Methionine +Cysteine / Lysine Ratio		0.63	0.63	0.63	0.63
Threonine / Lysine Ratio		0.67	0.68	0.66	0.70
Tryptophan / Lysine Ratio		0.18	0.18	0.19	0.19

\*: The digestible energy values were calculated from the CDPQ-MAPAQ tables.

***SWINE STATION TEST PROGRAM (SSTP)  
NOVEMBER 2009 AND MAY 2010 TESTS (N° 27 AND 28)  
PUREBRED SWINE TEST***

**REQUEST FOR PARTICIPATION IN TEST 27 (November 2009)**

**(Purebred swine breeders)**

We have read the protocol provided by CDPQ and accept all conditions.

We accept that the performance records and DNA samples will be taken on all pigs at the test station and we accept that the genotyping of SNPs panels and analysis of SNPs will be achieved when the funding plan will be accepted.

We do intend to provide the number of castrates declared below as an in-kind contribution to complete Test 27 (entry into the test station November 11 and 18<sup>th</sup>, 2009):

**Declaration of castrates**

Breed	Number of castrates	Number of Litters (approximation)	Number of sires (approximation)
Duroc			
Yorkshire			
Landrace			

Name of resource person: \_\_\_\_\_

Organization's name: \_\_\_\_\_

Email address: \_\_\_\_\_

Phone number: \_\_\_\_\_ Fax : \_\_\_\_\_

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

\_\_\_\_\_

Signature: \_\_\_\_\_

**Return by May 31, 2009 to: Frédéric Fortin**

Centre de développement du porc du Québec inc.  
2795, boul. Laurier, bureau 340  
Québec (Québec) G1V 4M7  
Tel. : (418) 650-2440 p. 110 – Fax. : (418) 650-1626  
Email: [ffortin@cdpqinc.qc.ca](mailto:ffortin@cdpqinc.qc.ca)

***SWINE STATION TEST PROGRAM (SSTP)  
NOVEMBER 2009 AND MAY 2010 TESTS (N° 27 AND 28)  
PUREBRED SWINE TEST***

**REQUEST FOR PARTICIPATION IN TEST 28 (May 2010)**

**(Purebred swine breeders)**

We have read the protocol provided by CDPQ and accept all conditions.

We accept that the performance records and DNA samples will be taken on all pigs at the test station and we accept that the genotyping of SNPs panels and analysis of SNPs will be achieved when the funding plan will be accepted.

We do intend to provide the number of castrates declared below as an in-kind contribution to complete Test 28 (entry into the test station May 24 and 31<sup>st</sup>, 2010):

**Declaration of castrates**

Breed	Number of castrates	Number of Litters (approximation)	Number of sires (approximation)
Duroc			
Yorkshire			
Landrace			

Name of resource person: \_\_\_\_\_

Organization's name: \_\_\_\_\_

Email address: \_\_\_\_\_

Phone number: \_\_\_\_\_ Fax : \_\_\_\_\_

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

\_\_\_\_\_

Signature: \_\_\_\_\_

**Return by Dec 16, 2009 to: Frédéric Fortin**

Centre de développement du porc du Québec inc.  
2795, boul. Laurier, bureau 340  
Québec (Québec) G1V 4M7  
Tel. : (418) 650-2440 p. 110 – Fax. : (418) 650-1626  
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