



# INTRODUCTION FILE SAL PLEX™ KIT PS

## SALMONELLA TEST FOR PORCINE SERUM

### RnA ASSAYS

RnA BV is the inventor of RnAssays®, a series of comprehensive assays developed at the Utrecht University. RnA is the proprietor of patents for the innovative covalent coupling of antigenic and receptor structures to solid surfaces, such as those of microspheres, sensor-surfaces or sensor-tips.

RnA is specialized in the development and application of rapid, accurate and cost beneficial, diagnostic assays for safety and quality control in the primary and secondary food production sectors, with the focus on food of animal origin.

### SALMONELLA INFECTION IN PIGS

Salmonellosis is an infection as a result of *Salmonella* bacteria. Clinical salmonellosis in pigs is of minor importance for the animal itself, but will result in shedding of the bacteria at a high level in the faeces. Pigs with sub-clinical infections only excrete bacteria intermittently at low levels during the first half of the fattening period.

### HUMAN SALMONELLA INFECTION

*Salmonella* bacteria of the human are usually contracted by ingesting raw or undercooked animal products, such as eggs, poultry, meat, milk and dairy products. The dominant serovar in pigs is *S. typhimurium*. In the EU, 0-9% of the pigs are infected with *Salmonella* at slaughter and 0-18% at processing. *Salmonella* monitoring programs in pig populations are necessary to evaluate the results of a control programme over a period of time.

### RnA MULTIPLEX SALMONELLA ASSAY

The RnAssays® product-line is based on a multi-analyte plex assay that can determine multiple microbial and non-microbial contaminations simultaneously in a single sample and analysis run. A minimal animal-derived sample volume is required.

The *Sal Plex™ kit PS* is an innovative and new multiplex assay for *Salmonella* serogroup testing. It measures anti-*Salmonella* antibodies in serum. The sensitivity and specificity for serogroup B is determined by comparing the results of mesenteric lymph node culture with the results of the *Sal Plex™ kit PS* on corresponding sera collected from 1,040 pigs. At a recommended cut-off value of 60, these samples with an unknown infection background, revealed a relative sensitivity and specificity of 72% and 70%, respectively.

The immunoassay uses capturing antigens fixed on distinct sized microspheres designed for binding with antibodies. Discrimination of the individual microspheres is arranged by different internal fluorescent intensities, which lead to the access of multiple analytic results per sample. Using flow cytometry not only can fluorescent intensities of microspheres be detected, but also small size variations can be distinguished. In the RnAssays® technology, this combination of three bead sizes and twelve fluorescent intensities offers up to 36 bead variants, allowing the simultaneous detection of 36 different analytes.

### The benefits of Sal Plex™ kit PS

**Sensitive:** 100% of the EFSA (European Food Safety Authority) reported *Salmonella* isolated serovars (more than present ELISA tests).

**Specific:** serogroup-typing (B, C<sub>1</sub>, C<sub>2</sub>, D and E).

**Flexible:** Single or multiple analyte analysis.

**Precise:** Serogroup profiling reveals non-*Salmonella* cross reacting antibodies. The low CV's (Coefficient of Variation) give less false-positive results, in particular, close to the decision limit. In both cases, the number of false-positives are decreased, which can reduce the costs of confirmational analysis and of falsely condemned carcasses.

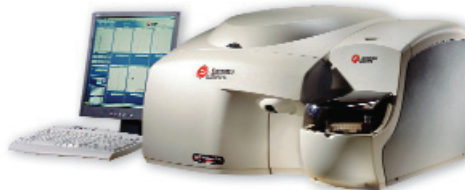
**Fast:** less than 1 hour for a single sample and at high throughput approx. 90 samples/hr, equaling 450 data points per hour with a *Sal Plex™ kit PS*.

**Economical benefit:** labour and overall time-saving. There is the option of leasing out the hardware.

**Versatile:** Combining the detection of *Salmonella* along with other microbiological and non-microbiological contaminants, such as *Trichinella spiralis* and sulphonamides, will be possible according to the needs of the user.

### NEW TECHNOLOGY SAVES TIME AND MONEY

The combined technology of microspheres and a patented unique surface modification of these microspheres enables one to detect an infection by *Salmonella* serovars from the serogroups B, C<sub>1</sub>, C<sub>2</sub>, D and E at ambient temperature (total incubation time: 45 min). In this way RnA has developed time and cost-savings (average 25-35%) diagnostic assays for safety and quality control.



### BECKMAN COULTER HARDWARE

The *Sal Plex™ kit PS* analyses are carried out with the Beckman Coulter Cell Lab Quanta™ SC MPL (Basic Plex™). The unit can be expanded with a Biomek NX automation workstation with shaker- and vacuum-unit, robotic liquid handler (Silver Plex™), or ultimately with a Biomek Robotic Transport device and the Cytomat Microplate Hotel Storage system (Gold Plex™). The operational hardware can be used in a rental lease arrangement.

### FUTURE DEVELOPMENTS

Following the *Sal Plex™ kit PS*, RnA is developing a series of easy-to-use kits to determine the presence of agents, such as PRRS (Porcine Reproductive and Respiratory Syndrome), *Trichinella spiralis*, *Toxoplasma gondii*, and antibiotic sulphonamide residues.

The RnAssays® kits meet current and future legislation demanding fresh food which is free from specific contaminants. The kits are suitable for modern routine laboratories in terms important criteria such as high-throughput, short hands-on times, and are cost-effective.

### AWARDED TECHNOLOGY

RnA received the World Poultry Award 2006 for its innovative Plex™ technology and was awarded the international Eureka status in November 2007.



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