


- tissue sampling with animal identification
- sample handling, storage and transport
- lab integration

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## Ear tags for tissue sampling

transparent projectile with metal blade

sample container with/without desiccant





male part

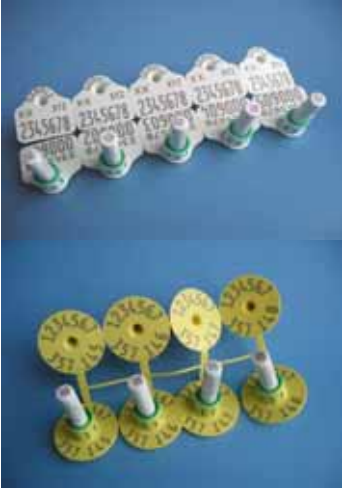
female part

desiccant

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# Types of ear tags

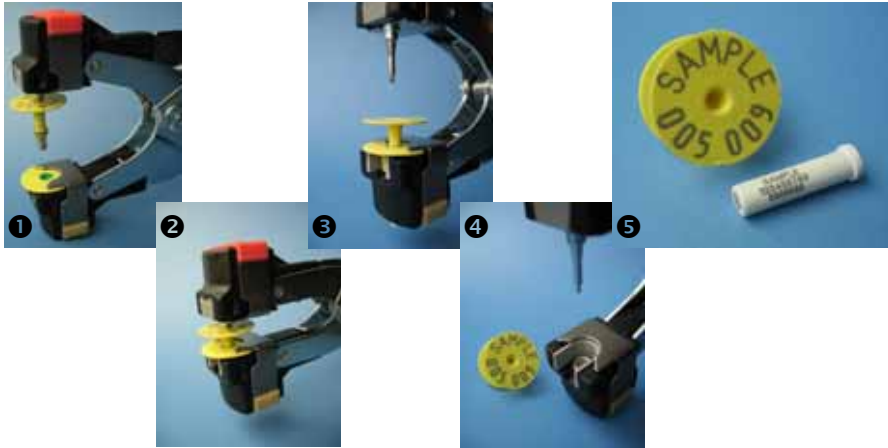


- official identification for cattle and sheep in combination with tissue sampling possible
- button tags for all species
- also available with RFID

# RFID and tissue sampling



## Tissue sampling



## Range of application

- parentage testing
- determination of genetic defects
- proof of origin (e.g., quality meat programs)
- genotyping (e.g., scrapie)
- diagnostics (e.g., BVD antibody test)

## Advantages

- 😊 definite allocation of sample and animal
- 😊 effective and time saving through automated data registration (human errors prevented)
- 😊 improvement of processing costs (standardized tissue samples)

## Standardized sample size



## Instrument for sampling



- Press cut with max.  $\emptyset$
- Fixing of tissue sample by special geometry of blade
- Possibility to control presence of sample through lenticular membrane with magnifier effect

## Control of sampling



- Visual control of presence of tissue sample in locked sample container without technical device
- Lenticular membrane delivers insight into the whole cavity of the sample container
- Presence of sample in the tube can be verified also in the lab

## Applicators

one type applicable for all ear tags

with or without tissue sampling



parallel closing mechanism

available adapter for all types of animal identification systems/ tissue sampling

- official ID cattle/ sheep
- button tags
- vet kits
- all other conventional ear tags (visual identification)

## Sample identification

unique and guaranteed well-defined



labelling standard:

- DataMatrix-code with unique number
- customized identification  
(line one – up to 12 letters)
- individual sample number  
(2<sup>nd</sup> and 3<sup>rd</sup> line – up to 24 numbers)

## Sample registration

- scanning of bottom printed DataMatrix codes in 96 position rack
- decoding and linking of individual sample numbers with each position on the rack

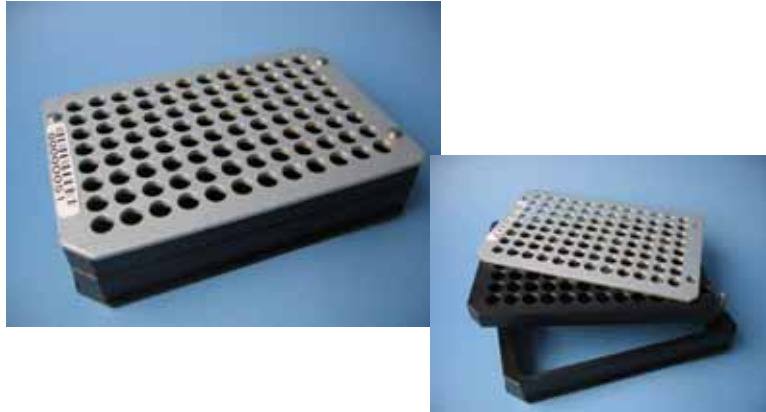
## Data transfer to automated analytics

### generating data for data transfer

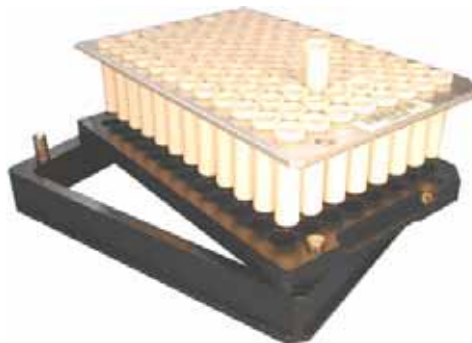
rack no.	column	row	sample no.	comment	
2008-06-18	11:09:12				time stamp
123456	1	A	8000400010001387	good read	code deciphered
123456	2	A	8000400010001367	good read	
123456	3	A	8000400010001375	good read	
123456	4	A	8000400010001378	good read	
123456	5	A	8000400010001413	good read	
123456	6	A	8000400010001438	good read	
123456	7	A	8000400010001420	good read	
123456	8	A	0	code error	code not recognized
123456	9	A	8000400010001439	good read	
123456	10	A	8000400010001417	manually corrected	corrected data entry
123456	11	A	8000400010001418	good read	
123456	12	A	0	vacant	vacant position
123456	1	B	8000400010001293	good read	
123456	2	B	8000400010001352	good read	
...					

## Lab integration in 96-well format

analysis in standard 96-well format



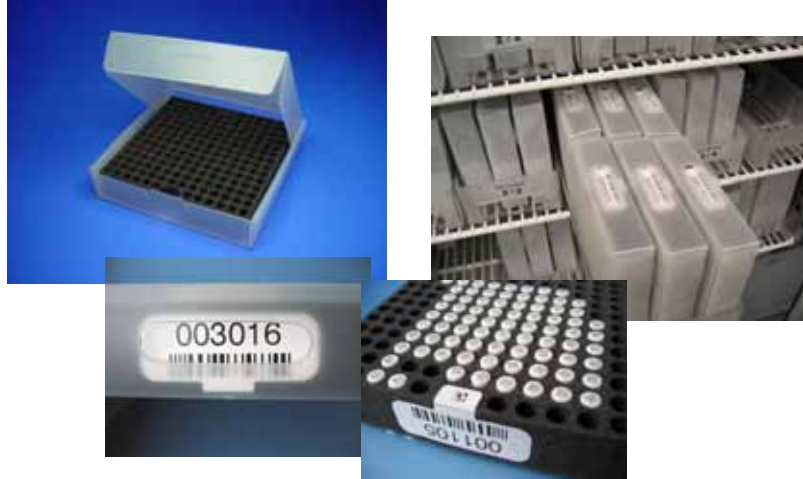
## Rack for 96-well format



- 96- position rack for highly efficient analysis
- all required steps performable on the same rack:
  - sample registration
  - opening of samples
  - lysis
  - DNA-purification
  - PCR preparation
  - ...



## Storage / transport



## Advantages of data handling

- no manual data registration
  - no handwritten transfer of sample data to lab databases or analysis reports
- elimination of human error

## Advantages of sample-handling

### efficient storage management

- documentation of all storage movements
- documentation of sample throughput
- increase in performance

➔ reduction of costs

## Automated opening of samples

pneumatic press with  
exchangeable punching tool



opening by piercing  
bottom or punching  
through membrane from  
top

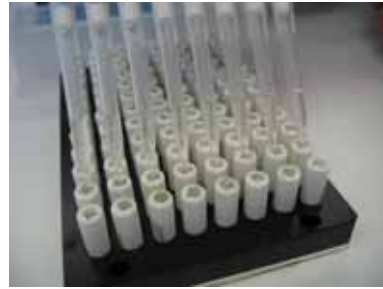


guaranteed  
contamination free

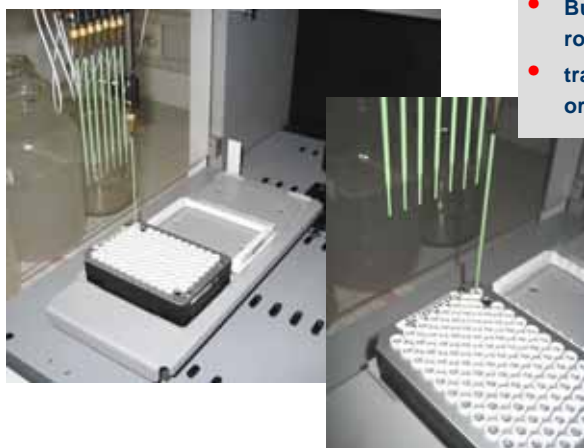


## Sample processing by hand

- ✓ lysis and incubation directly in the sample container with established protocols
- ✓ liquid handling with conventional lab methods



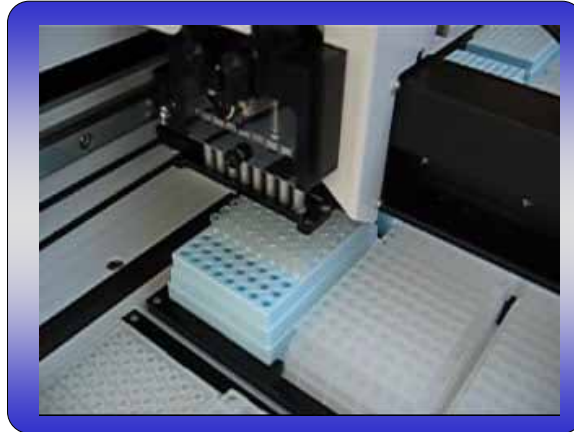
## Automated sample processing



- Buffer dispensing with robot
- transfer of eluate to ELISA or PCR well plates

## Automated liquid handling

e.g. for PCR pooling with Corbett robot



## Capacities / performance

process	duration	throughput	comment
positioning on 96-rack	+/- 3 min	2000 samples/h	possible identification of damaged sample tubes
registration with scanner	+/- 3 min	2000 samples/h	possible cleaning of dirty sample tubes
opening with punching tool	+/- 2 min	3000 samples/h	punching tool needs to be decontaminated on a regular basis

**Thank you very much for your attention!**

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