

RFID Technology

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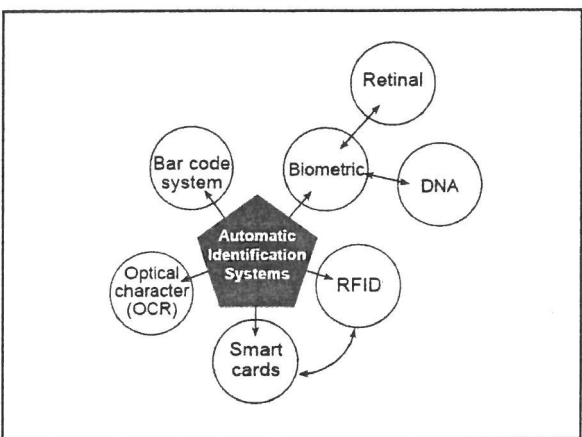


Why is Visual ID not Sufficient by Itself?

- Does not identify animals as unique individuals that correlate back to a single herd
- Does not indicate herd of origin
- Does not meet the international requirements as a valid form of identification
- Does not facilitate the recall or collection of information in an accurate and timely manner

Why Electronic ID? (eID)

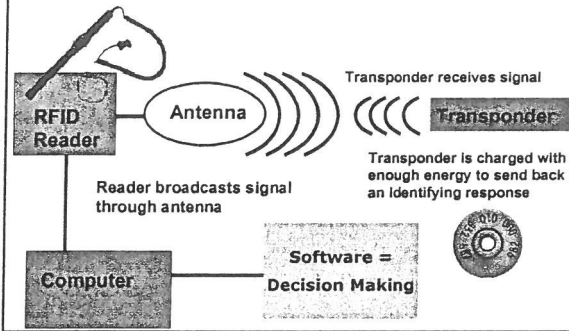
- Provides the linkage necessary for converting data into accessible and useable information with greater accuracy and timeliness



What is Radio Frequency ID?

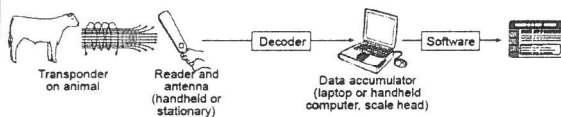
- Sister technology to barcodes
- Radio waves vs light waves
- Reads through non-metallic materials
- Does not require line-of-sight
- Withstand harsh environments

Components of an Electronic ID System



Visual ID	Electronic ID	Temperature	Weight	Castrate	Dehorn	Comments
2	27152 GA 00000 0 996 000000215242	2.8	342	Y		
3	27154 GA 00000 0 996 000000212792	5.7	454	Y		
4	27155 GA 00000 0 996 000000212114	2.8	340	Y	Y	
5	27156 GA 00000 0 996 000000213920	4.3	236	Y		
6	27157 GA 00000 0 996 000000212259	5.3	280	Y		
7	27158 GA 00000 0 996 000000212118	4.0	288	N		
8	27159 GA 00000 0 996 000000211976	2.7	282	N		
9	27160 GA 00000 0 996 000000210877	2.1	396	Y	Y	
10	27161 GA 00000 0 996 000000209873	3.5	390	Y		
11	27162 GA 00000 0 996 000000209135	4.1	352	N		
12	27163 GA 00000 0 996 000000216121	2.0	276	Y		
13	27164 GA 00000 0 996 000000215549	3.0	388	Y		
14	27165 GA 00000 0 996 000000215852	5.3	384	N		
15	27166 GA 00000 0 996 000000205838	2.9	258	Y		
16	27167 GA 00000 0 996 000000215442	4.4	398	Y		
17	27168 GA 00000 0 996 000000212956	5.5	380	N		
18	27169 GA 00000 0 996 000000209914	2.8	378	N		
19	27170 GA 00000 0 996 000000211017	5.2	324	N		
20	27171 GA 00000 0 996 000000214062	2.7	356	N		
21	27172 GA 00000 0 996 000000215433	5.1	428	Y		

Components of an Electronic Identification (RFID) System



TRANSMITTER/resPONDER

- Passive vs active
- Data carrying options
- Data read rates
 - Programming options
- Physical form
- Costs

Passive vs Active Transponders

- Passive
 - No internal battery
 - Lighter
 - Less expensive
 - Virtual unlimited operational life
- Active
 - Internal battery- finite lifetime
 - Read/write devices
 - Greater size/cost
 - Greater communication range
 - Higher data transmission rates

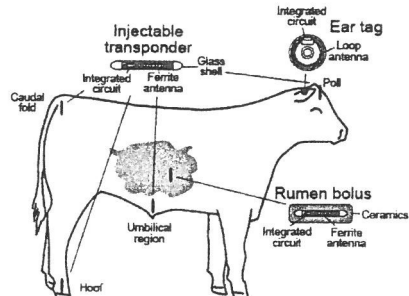
Data Carrying Options

- Identifier
 - Numeric/alpha-numeric string for ID purposes
 - Simple "lookup" number
- Portable data files
 - Decentralized database
 - Increased tag complexity usually accompanied by an increase in the data memory of the device which, in turn, generally reflects an increase in cost

Data Read Rates

- The higher the frequency, the higher the data transfer rates

Physical form



ISO Standards

- **ISO 11784** = Represents the data numeric structure of the 64 bit (character code for electronic animal transponders)
- **ISO 11785** = Describes the accepted protocol for transmission between the reader/scanner and the transponder (tag). The standard consists of two transmission protocols, half-duplex (HDX) and full-duplex (FDX-B)

Challenges/Issues RFID

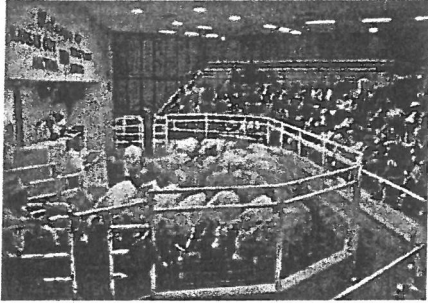
- **Environment**
- **Read range**
- **Contention**

Factors that affect Reader Range

- Power available to the reader
- Power available within the tag to respond
- Antenna characteristics and size
- Competition from other devices emitting electric signals

Dielectric Materials

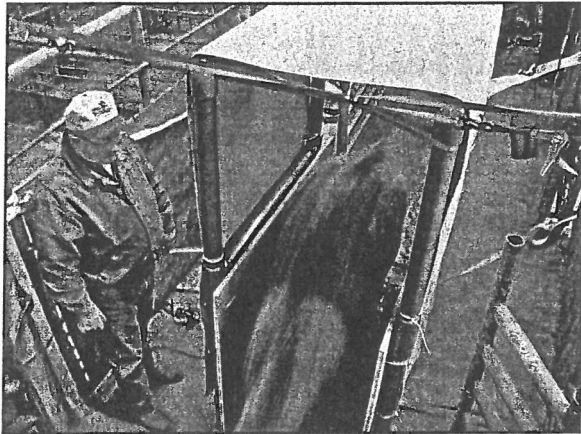
- Materials that freely:
 - Conduct radio energy
 - Absorb it
 - Detune it
 - Reflect it
- Liquids and metals present the biggest challenges



- Loss in efficiency
 - Added costs – Equipment/labor
 - Excessive handling

Anti-contention/collision: Defined...

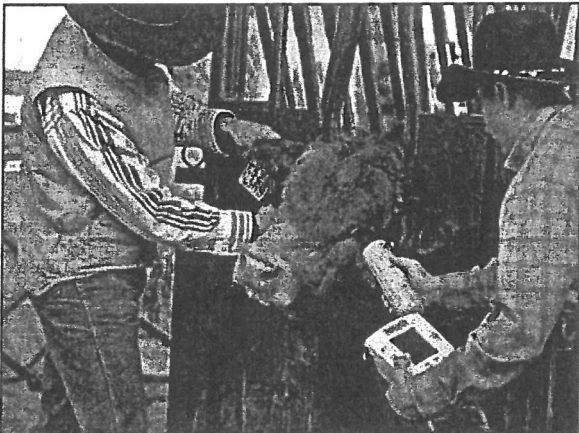
Term(s) used to denote an event when two or more transponders compete for attention from the reader at the same time resulting in potential misreading.



Technology Neutral

The Federal Government is indifferent:

"The right information to the right people at the right time"



beef
stocker
USA



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