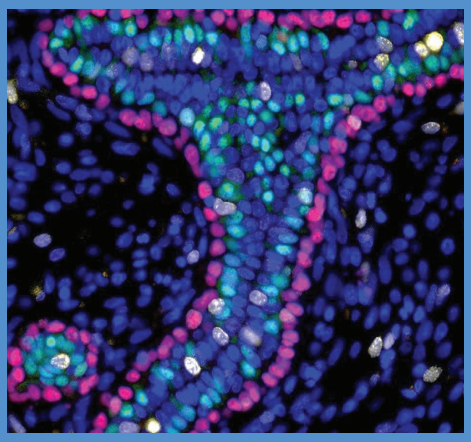
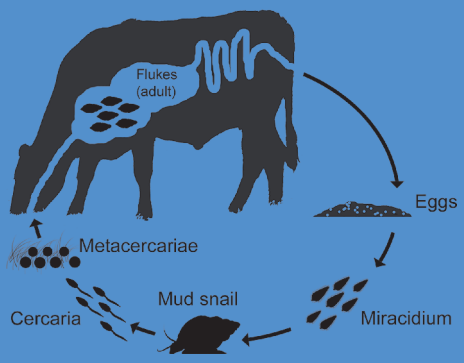
Large Dairy Herd Management

Third edition

Section 5: Genetic Selection Programs and Breeding Strategies





Edited by David K. Beede

Abbreviations

The following abbreviations may be used without definition in the book.

AA	amino acid
ACTH	adrenocorticotropin
ADF	acid detergent fiber
ADG	average daily gain
ADL	acid detergent lignin
ADIN	acid detergent insoluble nitrogen
AI	artificial insemination
BCS	body condition score
BHB	β-hydroxybutyrate
BLUP	best linear unbiased predictor
BSA	bovine serum albumin
bST	bovine somatotropin
BTA	*Bos taurus* autosome
BUN	blood urea nitrogen
BW	body weight
CI	confidence interval
CLA	conjugated linoleic acid
CN	casein
CNS	coagulase-negative staphylococci
CoA	coenzyme A
CP	crude protein
CV	coefficient(s) of variation
DCAD	dietary cation-anion difference
DHI(A)	Dairy Herd Improvement (Association)
DIM	days in milk
DM	dry matter
DMI	dry matter intake
DNA	deoxyribonucleic acid
EAA	essential amino acid
EBV	estimated breeding value
ECM	energy-corrected milk
ELISA	enzyme-linked immunosorbent assay
ETA	estimated transmitting ability
FAME	fatty acid methyl esters
FCM	fat-corrected milk
FSH	follicle-stimulating hormone
GnRH	gonadotropin-releasing hormone
h^2	heritability
HTST	high temperature, short time
IFN	interferon
Ig	immunoglobulin
IGF	insulin-like growth factor
IL	interleukin
IMI	intramammary infection
LA	α-lactalbumin
LG	β-lactoglobulin
LH	luteinizing hormone
LPS	lipopolysaccharide
LSD	least significant difference
LSM	least squares means
mAb	monoclonal antibody
ME	metabolizable energy
MIC	minimum inhibitory concentration
MP	metabolizable protein
mRNA	messenger ribonucleic acid
MUFA	monounsaturated fatty acids
MUN	milk urea nitrogen
NAN	nonammonia nitrogen
NDF	neutral detergent fiber
NDIN	neutral detergent insoluble N
NEAA	nonessential amino acid
NE_G	net energy for gain
NE_L	net energy for lactation
NE_M	net energy for maintenance
NFC	nonfiber carbohydrates
NPN	nonprotein nitrogen
NRC	National Research Council
NSC	nonstructural carbohydrates
OM	organic matter
PCR	polymerase chain reaction
$PGF_{2\alpha}$	prostaglandin $F_{2\alpha}$
PMNL	polymorphonuclear leukocyte
PTA	predicted transmitting ability
PUFA	polyunsaturated fatty acids
QTL	quantitative trait loci
r	correlation coefficient
R^2	coefficient of determination
RDP	rumen-degradable protein
REML	restricted maximum likelihood
RIA	radioimmunoassay
RNA	ribonucleic acid
RUP	rumen-undegradable protein
SARA	subacute ruminal acidosis
SCC	somatic cell count
SCS	somatic cell score
SD	standard deviation
SDS	sodium dodecyl sulfate
SE	standard error
SEM	standard error of the mean
SFA	saturated fatty acids
SNP	single nucleotide polymorphism
SPC	standard plate count
TDN	total digestible nutrients
TMR	total mixed ration
TS	total solids
UF	ultrafiltration, ultrafiltered
UFA	unsaturated fatty acids
UHT	ultra-high temperature
USDA	United States Department of Agriculture
UV	ultraviolet
VFA	volatile fatty acids

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Published by the
American Dairy Science Association®
1800 South Oak St., Ste. 100
Champaign, IL 61820
https://www.adsa.org/

Edited and produced by
FASS Inc.
1800 South Oak St., Ste. 100
Champaign, IL 61820
https://www.fass.org/

American Dairy Science Association®, Champaign, IL 61820

First edition published 1978
First revised edition published 1992
Third edition published 2017

ISBN: 978-0-9634491-2-2

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LDHM3_V1.1_082018_S5

Cover images

Top left: *Example of immunofluorescent staining in prepubertal bovine mammary tissue. The cross section of the developing duct shows the expression of p63 (red), which indicates myoepithelial nuclei, estrogen receptor (green), about 50% of the epithelial cells, and Ki67 (yellow), a marker for cell proliferation; DAPI staining (blue) is a general DNA stain that labels all cell nuclei.*
[Chapter 9-59: Mammary development in calves and heifers; Figure 4D]

Top center: *The daily trail to (and from) milking.*
[Chapter 10-67: Mastitis control in pasture and seasonal systems; Figure 3]

Top right: *Cow brushes are clearly a valued resource as they are used voluntarily by cows and are required by some voluntary assurance programs. Photo credit: DeLaval, Tumba, Sweden.*
[Chapter 11-71: Assuring and verifying dairy cattle welfare; Figure 2]

Bottom left: *The bedding material commonly recommended for controlling environmental mastitis is washed sand.*
[Chapter 10-65: Practical approaches to environmental mastitis control; Figure 3]

Bottom center: *Life cycle of a liver fluke.*
[Chapter 12-81: Parasite control in large dairy herds; Figure 2]

Bottom right: *Studies have shown that positive handling is correlated with cows having low fear responses to people and higher milk production. Some animal welfare standards now include a standardized test of avoidance distance to people as a way of screening for appropriate handling and good human–animal relationships on farms. Photo credit: University of British Columbia (UBC) Animal Welfare Program.*

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Section 5: Genetic Selection Programs and Breeding Strategies

Note

This section is an excerpt from *Large Dairy Herd Management*, third edition. As such, links within these chapters to other sections of the book are not functional. Other sections of the book are available for purchase at https://ldhm.adsa.org/. The front matter and index of the complete book are available as free downloads.

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