

Factors affecting meat quality in farm animals

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¹ & X N X U R Y D 8 Q L Y H U V L W \) D F X O W \ R I \$ J U L F X O W X U H ' H S D U W P H Q W R I \$ Q L P D O 6
² \$ G Ö \ D B Q Q Y H U R V E R W L R Q D O + L J K 6 F K R R O R I . D K W D ' H S D U W P H Q W R I 9 H W H U L Q D U V

Abstract . 0 H D W K D V E H H Q R Q H R I W K H P R V W E D V L F Q X W U L H Q W V V L Q F H W K H
H [S U H V V H G D V W K H P X V F O H D Q G I D W I R X Q G E H W Z H H Q W K H E R Q H V D Q G
K X P D Q Q X W U L W L R Q G X H W R W K H F I S G A R W H L Q C H U D P L V Q R L U D F Q G D V Q G I D L V Q W D Q
H V S H F L D O O \ % L W F R Q W D L Q V 7 K D Q N V W R W K H V H Q X W U L H Q W V Y L W
L Q G L Y L G X D O V U H J H Q H U D W L R Q R I F H O O V U H S D L U D Q G J U R Z W K R I W L V
E R G \ V \ V W H P V G H Y H O R S P H Q W R I L P P X Q L W \ D Q G U H S U R G X F W L R Q D U H H
D U H I D F W R U V V X F K D V V S H F L H V E U H H G I H H G L Q J H Q Y L U R Q P H Q W D O W H
\ L H O G D Q G T X D O L W \ L E D O V , Q W K H F X U U H Q W V W X G \ V L P L O D U E L R W L F D
T X D O L W \ R I I D U P D Q L P D O V D U H G L V F X V V H G

1 Introduction

Table 1. 0 H D W R G X F W L R Q Y D O P L I O O I L R Q W K R I Q Z R

0 H D W Z K L F K F R Q W D L Q V Q X W U L H Q W V L Q K L J K > T X D Q W L W \ D Q G
T X D O L W \ K D V D Q L P S R U W D Q W S O D C H Y L 2 0 0 8 H 2 0 0 9 2 0 1 0 2 0 1 5 W 2 0 2 0 W 2 0 2 1 Q , W L V
J H Q H U D O O \ Q D P H G D F F R U G L Q J W R & W L C H W A S H R I D O L P D O L W V
R E W D L Q H G I U R P E H H I O D P E J R D W 8 0 \$ H D W H W F ' H S H O G L O J R Q
W K H V S H F L H V W B H L S V R W H L W D D L F L V C P L Q H U D O V
D Q G I D W W \ D F L G V L W F R Q W D L Q V 5 X V Y 7 K H V H Q X W U L H Q W V D U H
H V V H Q W L D O I R U W K H G H Y H O R S P H Q W D Q G J U R Z W K R I W L V V X H V D Q G
R U J D Q V W K H I X Q F W L R Q L Q J R I Y L W D G V \ V W H P V U H S U R G X F W L Y H
D F W L Y L W L H V D Q G W K H G H Y H O R S P H Q W R I L P P X Q L W \ , Q D G G L W L R Q
L W D L V R R G G L H W D U \ S U R G X F W D V L W V S H Q G V P R U H W L P H L Q W K H
G L J H V W L Y H V \ V W H P G X H W R L W T a b l e 2 . 0 H D W F R Q W X L Q S W F R Q W Y D O X H D Q G W K H
S U R Y L G H V V D W L H W \ I R U D O R Q J W L P H) R U D F K H D W K \ @ L I H L W L V
U H F R P P H Q G H G W R F R Q V X P H D S S U R T L P D W H Q \ 2 0 0 2 2 0 0 9 G D \ 2 0 1 1 2 0 2 0
S U R W H L Q S H U N J R I E R G \ Z H L J K W > & @ Q Q K D O T R I W K L V D P R X Q W
V K R X O G E H R E W D L Q H G I U R P D Q L P D O 8 6 \$ S U R W H L Q V > @
, Q V X I I L F L H Q W P H D W F R Q V X P S W L R Q U F D X V H V D G H F O L Q H L Q
P X V F O H D Q G V N H O H W D O G H Y H O R S P H Q W L H V S H F L D O O \ L Q F K L O G U H Q
G X H W R S U R W H L Q D Q G P L Q H U D O G H U P P H H Q F \ , Q F D V H V Z K H U H
P H D W F R Q V X P S W L R Q Z K L F K L V D O V R Q Q L J R R G V R X U F H R I L U R Q L V
L Q V X I I L F L H Q W D Q H P L D R F F X U V D W H I L F G F L Q W D N H G H F U H D V H V
U H S U R G X F W L Y H D Q G L P P X Q H S U R E O H P V D Q G S U R E O H P V L Q
F R J Q L W L Y H G H Y H O R S P H Q W R F F X U 7 K D U W K H V R W I O H O H D Q G C H O D W L R Q V K I
V W D W H G W K D W Z K H Q F R Q V X P H G H Y H O R S P H Q W L D Q G F D R H W F R Q V X P
F D U G L R Y D V F X O D U G L V H D V H V P H W Z H R Y L L F S U R E O H P V K R X Q G K R P H D P R X
W \ S H V R I F D Q F H U > L Q F U H D V D D L Q S W K R O M H G L Q F R X Q W U Q G V D X F K U D F D S
S R S X O D W L R Q P H D W S U R G X F W L R Q H D P E O R Q V X D P S W L R Q V X P S W L R Q E H K L Q
7 D E O H Y D O X H V L Q W K H Z R U O G W D R W K H F R Y U H F U R Z G L Q J R I W K H S R S X

1.1 Meat quality

7 K H T X D O L W \ R I P H D W Z K L F K K D V D
S H R S O H V K H D O W K \ Q X W U L W L R Q L V
S U R G X F W L R Q \$ O W K R X J K V H Q V R U \ Q

* & R U U H V S R Q C L E Q O O X W F K R W G X W U

SURSHUWLHV DUH WKH EDVLF HOHPSHOWN QXVHGG EW RV IGHV VDOULPDOVDWPKHD
 TXDOLW\ RI PHDW WKH\ PD\ YDUIDEWRUSHUZRQ WKH SRWKRQ RKDQG P
 IURP VRFLHW\ WR VRFLHW\ , Q WSHUHWRU QXWLRQV ERQGQ VSLRSHUWLRU
 DPLQR DFLGV DQG YLWDPLQV VXDSDVHG WIZKSEFKDDUHUHQDWH VRPH R
 IRXQG LQ RWKHUHQDQGDWRDZHU SURSHUWHS PHDDV TXDOLW\
 OHDGLQJ UROH LQ WKH TXDOLW\ RI PHDW JURP WKLW SHUVSHFWLYH
 UHG PHDW VWDQGV RQH VWHS DKHDG RI RWKHU PHDWV 2Q WKH
 RWKHU KDQG WKH QXWULWLRQDO YDOXH RI PHDW ,W YDULHV
 GHSHQGLQJ RQ VSHFLHV DJH JHQGHU JHQHWLF HHDGWRU DQG
 otKHU HQYLURQPHQWDO IDFWRUV RQKHSWLEOH DQDORZ VHG ZVUWKRQJ W
 QXWULWLRQDO FRPSRVLWLRQV RI PHDW IURP WGLVQHWLWLV SHGHVWR
 7DEOH

Table 3. 0HDW 1XWULWLRQDO &RPSRVLWLRQ

	&KLFN	%Q	HBRUN	7XUN VNLQ	'XFN VNLQ
Energy (kcal)					
Protein (g)		21			
Fat (g)					
Saturated Fat (g)					
Vit. B12 (mcg)			1		
Na (mg)	78				
Zn (mg)					
P (mg)		167			
Fe (mg)					

7KH SDUDPHWHUV H[DPLQHG LQ SHOHQDQDRO WHQFHU WK@
 H[DPLQHG XQGHU PDLQ KHDGLQDQV , &KLVNLQDQ ZQU WKDUX FWKHU QXWULH
 FKHPLFDO DQG VHQRU\ 7H[WXUJLQDLWQH (RVHWKHL DQQPDRLVWXUH
 SK\VLFDQ SURSHUWLHV RI PHDW FRPSRQDOWR FRQFHQWUJHQRVWK VV
 OLVWHG DV KDUGQHVV FKHZDESRSHUWLDWLELWXQWQDQDQV VV WK
 JXPPLQHVV DQG UHVLOLHQFH ,QFRQWV WAXRI ZDWHU DQXHZDQV DJH
 FRRNLQJ ORVV DUH RWKHU TXDOLW\ IDYDPRVSHUWVWKDQDQV QKQNDV
 SD\ DWWHQWLRQ WR &KHPLFDO LQFDUHDWHS DQXPHQW FRORQJLQ WLEHU
 PRVW\ RI QXWULWLRQDO HOHPSHOWN WKH WKHQGHUHQFH WKH PHDW >
 PRLVWXUH RU GLLQ PDPV RUDFS LG RSHUWU PHDWV ZLWK D EULJKWHU UHG
 DFLGV YLWDPLQV DQG PLQHUHQVDPRKQWHRIS DUDPHQDQV +LJKHU P
 GHWHUPLQH WKH IODYRU RI WKH DQDORZVHQDQV DQWPDQV DQDQV
 YDOXH HVSHFLDOO\ GHSHQGLQJ RORVVRIDWKH BHDQ FRPSRVLWLRQ
 7KH PRVW WDNHQ LQWR FRQVLG RORZWKOLWV SDYDPRVSHUWV BFXQV
 PHDWV VHQRU\ SURSHUWLHV (ORVSHUWVWKDQV FRQRURZWKORV PXVF
 DQG WDVWH SHUFHLYHG E\ WKH IRUWVQRV RUDQVWRQ RHWKBDQHEFHOC
 HDVLO\ GHWHFWHG E\ FRQVXPHU DQDQV KQES WKHPDQVLRQYHQDQV OH
 LGHD DERXW PHDW IHG ZLWKQKILWK UDWLRQV KDYH KLJKH
 WKDQ WKRWHHQGUZLWUDQV > @
 GLHWDU\ HQHUJ\ OHYHO LQFUHDVHV L
 WKH DPRXQW VRVWDDQV FRQQHFWLYH
 LRSURYHU PHDW RMDTXDOLW\ WDWG
 FKHPLFHWV WDFEHRHDKLQHG /RZ
 SKPHWV WDFEHRHDKLQHG
 SURVWV XJKVXHDQV DQG UDW
 DQG DIWHU VORVWKVPHRUSVWV
 PDRUW UHGXFH WKH ZDWHU FRQWH
 KDQGLW KQV EHQHHSRUVHG WKD
 LQGHSHQGHG KQV EHQHHSRUVHG WKD
 ZH WKHGLQXVH HQFDQVWVHQDQV
 LDQHYV DQGLVWUHV LQ DQLPDOV IHG ZL

1.2 Factors effecting meat quality

6RPH IDFWRUV SOD\ D UROH LQ R
 PHHWV WKH FRQVXPHU V ZLVKHV
 XQGHU WZR PDLQ KHDGLQDQV
 DQG DIWHU VORVWKVPHRUSVWV
 PD\ EH DQLPDO GHSHQGHQW RU
 6SHFLHV DQG EUHHG JHQGHU DJH
 RI WKH PXWODXJKVWUHU FRQGLWLRQV

1.1 Ante-mortem factors

Species and breed:

Gender:

Nutrition:

RI WKH IDWWHQLQJ DQG VLQDJH VZHQ WR DSHQWUDW/HG ZLWVK RGHWKWV
 WK GD\ > @ ,W KDV DOVRD EDHFLQ UDSSG UFWHGS QWKDW > @
 LQWHQVLYHO\ IDWWHQHG ODPEV FRQWDLQ KLJK DPRXQWV RI VWHULF
 DFLG DQG 38)\$ LQ WKHLU LQWUDP XVFXODU IDW ZKLOH VHPL-
 LQWHQVLYH IDWWHQH IDG ROUDFEOM KID WFW D DPHLGH
 FRPSRVLWLRQ > @ ,W LV HDVLUH ^{1,2 Post-mortem factors}
 TXDOLW\ RI SRXOWU\ RU PRQRJ ^{Temperature:} QWHPLFHQ H-QHWK RHPXU
 FKDQJHV LQ WKHLU UDWLRQV W DQ FWO WKXPLQDQW V DOLFWEFQ UH
 DFWLYLWLHV RFFXUULQJ LQ WKH WUXSHQD WXYH WOHG DFLGLV FRROLQJ
 WUDQVIRUPLQXIMHGHQWR GLIIHUHQWV QVQRWRM DFWHFLDQRI WKEWH WQLV
 XQVDWXUDWHG IDWW\ DFLGV DUH SURVW D VIEFHO G EPLWKKY LFXDLWEWQ
 8QVDWXUDWHG IDWW\ DFLGV XVH DQ UHGHFFHQX WULHQRW RLVQ DQG F
 JUHDWU RU OHVVHU DPRXQWV LQ SHHQMLQ HGHDK DWR ZKHUH XWL QFH LV
 WKH XQVDWXUDWHG IDWW\ DFLG WHPSHQD WX DQ RHPDQW VGLW WRP D UHC
 VDWXUDWHG E\ ELRK\GURJHQDWLBR ZHUUWPH QHPLWRBHD DQXP WKH PLF
 WKH\ DUH SUHVHQW LQ UHG PHDWRRN LQ RQ DQ DQW DGG QWR RPHR D RVD
 \$\$DUW IURP WKH EDVLF QXWULW ^{Storage:} DQ FRV SRQHQW DQWR RD WK RPDQ
 VXEVDQFHV LQ WKH UDWLRQ DOF DUFHQWV WLVW VHQ VIRU\ SORSJUWLPH
 RI PHDWQRZQWKDW KHUEV ZLWK V WURQ H DWRP D V SXGK D RZHUHQJ WKH
 WK\PH DQG URVHPDU\ LPSURYH W W LWDQ WJU HQ G MPHQQ D DPHDWHU GD
Season: \$QLPDOV HGHUJ\ QHHGV LQ FHDW H LQ FRPDUZH D WKRUWKH LCH WYH
 \$QLPDOV XVH WKLV HGHUJ\ ERWKUWR SURGXWR KDBWGEF RPHLSQ J7KHVH
 WKH PHWDEROLVP G\QDPLF DQG WR G QKXPQ WKH JKZH WIFH VORVQH UJ UHF
 E\ DFFXPXODWLQJ IDW XQGHU WKH WRLQJH KHUHI R UH D W K EHPHW MURUHV
 DQLPDOV IHG GXULQJ WKH ZLQW D G RQW R L Q V > PRUH IDWW\ 7KH
 IDWW\ DFLG FRPSRVLWLRQ DQG ^{Processing:} RKHV SURFHQWRH D D S L D Q V WR P
 IHG ZLWK IUHVK JUDVV LQ VSUSOHVHQ W H G XWRHWKHZ KRQVXPHU FDQ I
 YHJHWDWLRQ LV DEXQGDQW DOFPHDWU\ KLW HKSK\ E L H D Q V M D W W G L W B D W
 EURLOHUV KDYH GDUNHU UHGGH F X D Q G J H R Q J Z B U H E U H Q D W S R I R P W V L Q Q
 ZLQWRHPSDFUHG WR DXWXPQ > @ ,7H PK Q L P K A D U V X W K G D W W K R I E L F D R N H Q
 KRXU S+ D DQG E ZHUH IRXQG WR FLHQJLQK G U P L Q Z Q W H R Q W K D Q XVHG
 LQ DXWXPQ DQG VXPPHU > @ 7KH S O L H U W R H M D E R Q P S R Y H V F U L V S Q
 DQLPDOV LV PRUH DFWLYH GXULQJ W K D Z W W D N H R R Q W U E V O H L Q S W W K D P F
 ODFWLF DFLG UHOHDVHG DV D UH Y X S W Q O R Z S H V L R K H S G R H W K H Q G H D W K
 DIIHFWLQJ WKH FRORU DQG WHI W X H V , G U R G L V L R Q Q W K X U D W L R Q I K \
 DQLPDOV WKDW DUH VWUHVHG G R F X W R D W I D U H P H X W H P S I H R W W X U H S V R P H
 WKH VXPPHU PRQWKV LV DOVR Q H J D W H W O E D I W K H W H G R E V X P K U V 'U\
 VLWXDWLRQ LQWHQVILFDWLRQ RI DURPD WHGGH
Location of the muscle: \$V LW LV NQRZQ PHDWG FRQVXPW V W H L Q S R U N : K L O H Q
 DV KXPQ IRRG FRQVLVWV RI PXGLGHV WYLEDYL W W R Y L S H D Q L P O F D X V H
 ZLWK WKH DELOLW\ WR PRYH 7KH EURRUP H D W H U Z R J K H S G R P V X O H V S U R F
 LQ WKH ERG\ ZLOO EHFRPH KDUGHU DW W K E I L O F R A W D Q F W W P R W X U H K H P H D
 IRUHDUPV DQG KLQG OHJV RIKP D Q W D Q W Q D X V H D Q D R N Q L D Q G L W O D P E
 OHJV RI SRXOWU\ KDYH D KDUGHU D Q W U X G M X K E H W K R O P R W K E V S D U P W Q
 EHFDXVH WKH\ ZRUN KDUGHU +R Z H Y H U F D U R P D J L V V D R X W X O W R I V P
 GRUVL ZKLFK LV WKH OHDVW DFRGLYH SURVSHUWRQV WKH E L P S U R Q H G G
 PDPPDOV KDV WKH VRIWHVW VWUXG V X P H Q R D F L G G L J H V W L R Q L V L P S I
Conditions before slaughter: 6ODXJKWHULQJ LV D W R L X U F H P S U R Y H V W K H W H I W X U H S U
 VWUHVV LQ LWVHOI 7KH WLPH W D N H Q Q W R V W D Q Q W H Q G D U L D P W > W R @ W K
 VODXJKWHUKRXVH VODXJKWHUK ^{Cooking time:} Q R R M L R Q S U R F H W L Q V D S S O L H
 IRU VODXJKWHU ZDLW L Q L X Q G H U W W K H W X K Q Q S X Q D W H R I P H D W D V I
 DQG YLROHQFH FDXVH V W W H M V W W M P S A D D W X Q H F R W H R Q Y K D V E H H Q S U
 VFUHWLRQ RI KRUPRQH V X E K W H M L R H S W A H S K W V Q K X W L W L R Q D O I
 QRUHSLQHSKULQH DQG FRUWLVRQ X V Q F U H R V V R I S F R W G L Q L W D P L Q V
 JOXFRVH LQ WKH EORRG DQG JOFRUWHLQ W K H Q L Y H U D Q G R X M F O H Y W
 DUH UDSLGO\ FRQVXPHG DQG ODFWRN H P E L G W L Y H S U R G E X F H P S Q H U W X U H
 QRUPFRQGLWLRQV ODFWLF DFLG W K H Q R D P H Q D Q G R R D W R D D F U F R Y D O H Q
 UHVSLUDWLRQ-RHW D E R O H Y H G V L Q H W K Q O L Y H G Q L Q L R Q F I V W H L Q H D Q G V
 KHDUW +RZHYHU ZKHQ DQLPDO G X D W H J V Q D X O K W H U H G U A Q Q W K B Q G U R
 VWDWH DFLGLPHS W LV REWDLQH G X W U L W L R Q D O F W L X H V
 DFLG FDQQRW EH PHWDEROLJHG 7KHVH PHDWV KDYH D SDOH

2 Conclusion

5 9 - 6 WHHQ \$ 5 REVRQ -RXUQDO
 6 FLHQFHV
 0 HDW LV DQ LPSRUWDQW QXWULHQW* LQ SHRSOHV - EDODQFHG DQG
 KHDWK\ GLHW 7KHUH DUH PDQ\ QDFWLYH WKDW DIIHFW WKH
 QXWULWLRQDO FRPSRVLWLRQ GLJHWELOLW\ R\ RWKHU TXDOLW\
 SDUDPHWHUV RI PHDW 7KHVH FDQ EH ELRORJ\ QHURWLRQ -RXU
 WKH\ FDQ DOVR IRUP EHIRUH RU DIWHU XPRW RWHU 6LQFH PHDW
 TXDOLW\ YDULHV LQ OLQH ZLWK FRO% XPRW RWHU -RXUQDO\ RI \$
 GSHQGLQJ RQ WKH SHUVRQ UHJLRQ\ R\ RWKHU DQG\ \$H\ DQJ 6 FLH
 WKH DFFHSWDQFH VWDWXV RI WKH SURGXFHG PHDW LQ WKH PDUNHW
 SURGXFWLRQ ZLWKLQ WKH LQIRUPDWLRQ\ R\ RWKHU DQG\ \$H\ DQJ
 PDNHPDW\ HWDELOLW\ HYHQ HDVLHU -RXUQDO -

References

0 'XUPXú . .XUúXQ ø 3RODW \$oC
 Kutay + %HQOL 0 %D\ODQ + 5 .XW
 6 FLHQFH -
 3 : 5 /HPRQ 1XWULWLRQ\ DQJ 6 FLHQFH
 S ; :DQJ 7 =KDQJ < <DQJ / /LX 7
) 9LH[' 5HPRQG - / 3H\UDXG =KX 0 OD 6 ;LH)RRG 6FL 7HFKQ
 -RXUQDO R152XWULWLRQ
 0 .RXYDUL 6 7\URYRODV % ' 3 <DQJ LPSRWDNRV% 6XQ)URQWLHUV L
 0DWX 84LWDV GRL IPLFE
 \$QRQ\PRXV &URSV DQG /LYHVWR 5 5LFKDU\ RWRI UHIULJHUDWHG
)\$267\$7 PHDW TXDOLW\ VLV &OHPVRQ 8QLY
 KWWSV ZZZ IDR RUJ ID\$FVWVW HQ)RRG 1XWULWLRQ DQG &XOLQDU\ 6
 GDWH D
 \$QRQ\PRXV)RRG %DODQFHV 'DW\ \$267\$7 RI \$QLPDO-6FLHQFH
 KWWSV ZZZ IDR RUJ ID\$FVWVW HQ 'GDWD)%6
 GDWH E , *RPHJ 5 -DQDUGKDQDQ) & ,ED
 5 6 \$KPDG \$,PUDQ 0 % +XVVDLQ 0HDW 6FLHQFH
 DQG 1XWULWLRQ
 KWWSV GRL RUJ LQWHFKRSHQ
 . 5RPHMNR \$ 5\PDU] + 6DGRZQLN 6
 1LHPF]\N 1XWULHQWV
 0 - 7RWK (7 3RHKOPDQ ' (0DWWKHZV \$
 7FKHUQRI 0 - 0DF&RVV \$PHULFDQ -RXUQDO RI
 3K\VLR(QGR-FULQRORJ\ DQG 0HWDEROLVP
 (-(
 * , 6PLWK - <RVKLQR ' 1 5HHGV ' %UDGOH\
 5 (%XUURZV + ' +HLVH\ \$ & 0RVHOH\ %
 0LWWHQGRUIHU -RXUQDO RI &OLQLF (QGRFULQRORJ\ DQG
 0HWDE 890LVP
 / ;LRQJ - 3HL 0 &KX ; :X 4 .DOZDU 3
 <DQ ; *X \$QLPDOV 11
 8 6 *HOHWX 0 \$ 8VPDHO < < 0XPPHG \$ 0
 ,EUDKLP 9HWHULQDU\ 0HGLFLQH ,QWHUQDWLRQDO

12.

< /;LRQJ(0XOOLQWLNDK HQ 3
 %ODQFKDQJ: 0HDW 6FLHQFH
 0 +XPDGDQXGRHU(0HDW
 6FLHQFH-
 \$ 3 0RORQH\ 5 -)DOORQ 0 7 0RRQH\ ' - 7UR\
 /LYHVWR\XFWLRQ-6FLHQFH